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HISTORY AND ECONOMICS

THE FUR-TRADE OF CANADA

THE FUR-TRADE OF CANADA

BY

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GENERAL PREFACE

The present volume is intended to inaugurate a series of studies dealing with the chief industries of Canada. Each volume will seek to provide as thorough a presentation as possible of the industry concerned, of its particular conditions and of its main problems, of its economic organization, and in general of its contribution to the growth and prosperity of the whole country.

All the volumes in the series will be produced under the auspices of the department of Political Science in the University of Toronto, and every effort will be made to maintain a high standard of accuracy and comprehensiveness. In fact it is hoped that each volume will serve as a definitive statement of the actual position of the industry at the present time.

In a new country the story of an industry has a special significance, for it is generally one of rapid development from pioneer conditions and methods brought about by ever-changing adaptation to new demands. The difficulties it has to face are different from those which exist under a long-established civilization. It presents both peculiar opportunities and peculiar problems. We believe, therefore, that these studies will, taken as a whole, form an illuminating chapter in the history of industry.

The present volume is the result of an experiment undertaken in the endeavour to meet the needs of the students enrolled in the recently-established course in commerce. The experiment was conducted by Dr. Innis. Having prepared for it not only by historical researches in the Canadian Archives, but also by extensive personal investigation in the Northwest, in the course of which he travelled to the borders of the Arctic Ocean and later to the Yukon, he used the material so gathered as the basis of further studies by the

senior students of the course. Then, under his direction, a number of bulletins were issued, dealing with various aspects of the fur-trade. These were made available to the public through notices in the fur-trade journals and elsewhere, and were very favourably received. Owing to financial considerations only a limited number of these bulletins were supplied, but the response they met encouraged the department to issue the present volume, containing the more important results and conclusions arrived at. It should, however, be added that the book, though incorporating the results of these investigations, has been written wholly by Dr. Innis.

The present study does not deal with the historical development of the industry. The history of the fur-trade, which has an important bearing on the whole process of settlement and exploitation of the Canadian West, is the subject of a separate work which Dr. Innis has prepared, and which will be published in due course.

The department hopes to issue successive works at intervals of about two years. Another of its members is at present engaged on the investigation of the mining industry of Ontario and Quebec, and this will form the second study in the series. In the prosecution of these investigations, we desire to make special acknowledgment of the assistance rendered by a grant from the research fund of the University.

We hope that these volumes will have a practical value as well as an historical interest. We would welcome any suggestions bearing on the facts or conclusions presented, or any further information which any readers who are familiar with or engaged in the fur industry may wish to offer. Such communications may be addressed either to the department, or directly to Professor Innis.

R. M. MACIVER

AUTHOR'S PREFACE

The following work is the first part of a study of the fur-trade, and is largely descriptive of the modern trade. Reliance has been placed to a very large extent on the actual work presented in the separate studies on which it is based. The data have been gathered, and the conclusions suggested, by the students. The studies have been rearranged, additional material has been collected, and fresh interpretations have been made, but the basic work remains unchanged. Acknowledgments have been made throughout the work to the students concerned.

There remains the hopeless task of acknowledging obligations to those who have granted their assistance at various stages of the work. I am indebted to numerous people at present engaged in the fur-trade, especially in the Mackenzie River district, but mention should be made of the kindness of Messrs. W. Phillips, C. Sinclair, L. Romanet, and A. Brabant, officials of the Hudson's Bay Company; to Mr. J. K. Cornwall, of the Northern Trading Company, and to Mr. T. W. Harris, Indian agent at Fort Simpson. It would be impossible to thank sufficiently the numerous individuals of that district who spared no effort in placing their information at my disposal. In the actual preparation of the work I have been greatly indebted to many members of the staff of the University of Toronto. To Mr. W. S. Wallace, as Librarian of the University and as editor of the *University of Toronto Studies*, I am under especially heavy obligations. Dr. M. Palyi, of the *Handelshochschule*, Berlin, has kindly supplied a bibliography of the more important German works on the subject. Mr. F. C. C. Lynch and his staff at the Natural Resources Intelligence Service in Ottawa have rendered invaluable service at all times. Perhaps more than all I have been indebted to Professor R. M. MacIver for his constant encouragement throughout the preparation of the work.

H. A. INNIS

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I. INTRODUCTION

§1. FUR-BEARERS OF NORTH AMERICA

Standard works of reference describe fur¹ as a hairy covering of the skin of animals which has, lying alongside it, a longer covering called the overhair or, by fur-men, the guard hair. The roots of the guard hair penetrate more deeply in the skin than those of the fur. The fur is soft, silky, and barbed lengthwise, whereas the overhair is straight, smooth, and comparatively rigid. The function of the overhair is to keep the fur filaments apart, to protect them from injury, and to prevent them from felting. The purpose of the fur, of course, is to protect from cold, in the case of most land animals, or from water, in the case of "amphibious" animals (*e.g.*, the beaver), or from general possibility of injury, in the case of subterranean animals (*e.g.*, the mole). In land animals² whose fur is primarily a protection against cold, a change in season has direct physiological results. "Amphibious" animals are affected similarly, but in a less pronounced degree. With the advance of winter a layer of fat is formed under the skin, the skin itself becomes firm and white, and fur appears as a thick covering, often of a different colour. Conversely, with the advance of summer, the fur and hair are supplanted by new hair with a typical colour, while the skin with the disappearance of fat consumed during the winter and the shedding of the outer epidermis becomes thick and has a greenish tinge. The

¹See W. E. Austin, *Principles and Practice of Fur Dressing and Fur Dyeing* (New York, 1922), Chs. I-II.

²The fur comes in during the autumn, and improves in length and density until January and February. After these months the colour begins to fade. With prime land furs the leather is thin and papery. When the fur is shed, the leather becomes very much thicker. With amphibious animals the seasonal changes are less noticeable. See *Beaver Magazine*, Winnipeg, January, 1921.

change in colour is apparently a part of the adjustment to the change in season. Generally the amount of pigment increases as the equator is approached and decreases toward the poles. White surfaces¹ are poor heat conductors and serve to retain animal heat, as in polar animals—bear and fox—and as in animals which become white in winter—ermine and hare.

The physiological adaptation² of fur for protection may be shown more clearly. The finest, closest fur is that of the "amphibious" carnivora and rodentia, such as fur seals, otters, mink, beaver, and muskrats. Moreover, on these animals the underneath fur is thicker than that of the back. The opposite is typical of land fur-bearers. Most fur-bearing animals have darker hair on the back and lighter hair on the sides and underneath. Animals living in exposed areas, along the open coasts or in bare tracts of country, in which long distances must be covered to get food, are generally large, strong-limbed, and have coarse fur. Animals living in more

¹Various biologists hold, on the other hand, that white coloration in northern latitudes is primarily for protective purposes.

²See Introduction to H. Poland, *Fur-Bearing Animals in Nature and in Commerce* (London, 1892). It would be difficult to agree with the following comment, but the conclusions are suggestive: "Nature furnishes every Animal here [Hudson Bay] with extraordinary Furs to resist the Cold, that gradually fall off as the warm Weather returns; and which is somewhat extraordinary; so it happens with Dogs and Cats brought thither from Europe. As in all the Parts of the Bodies of animals, which are furthest from the Heart, such as Feet, Claws and Tails, the Blood is colder, and Circulation slower, it happens from thence, that those Extremities are very apt to freeze. But it is very well worthy notice that few of the Animals of this Country have long Tails or Legs; for Instance, the Bears, Rabbits, Hares, *American* Cats, Porcupines, &c., have all short ones; and those that have long Tails, as the Fox, &c., have those parts surprisingly protected by long bushy Hair, which keeps them from the sense of cold" (Henry Ellis, *A Voyage to Hudson Bay by the Dobbs Galley and California in the years 1746 and 1747 for discovering a Northwest passage*, London, 1748, pp. 178-9). "It may be said in general that Arctic forms and those living at high altitudes are the most plentifully supplied with hair, while tropical and sub-tropical forms are sparsely covered. An aquatic life tends to reduce the hair coat; if the animal is semi-aquatic as seals and otters the hair is reduced to a fine plush" (H. H. Wilder, *History of the Human Body*, New York, 1909, p. 100).

densely wooded areas¹ in which food and shelter are comparatively abundant have finer fur with depth of colour and lustre. An unusually severe winter with consequent scarcity of food and shelter tends to produce thin coats and poorer fur. Forest fires with their destruction of food and shelter have well-known effects. Young animals generally have thicker coats than old ones, as in the bear.

The more important fur-bearing animals are of the orders² Carnivora and Rodentia.³ These orders are found largely in the Palaearctic (Eurasia) and the Nearctic (North America) zoogeographical regions or in the Holarctic (Heilprin) region. Among the Rodentia the "amphibious" animals, such as the muskrat and beaver, are outstanding fur-bearers. Of these, the muskrat and the American beaver (*Castor canadensis* Kuhl) are confined to North America. The family Castoridae (beaver) is confined entirely to the Holarctic region. Among the Carnivora the family Mustelidae (marten, ermine) is most numerously represented in the subarctic portions of the same area. These animals are mostly terrestrial. They are small, having slender bodies, short legs, round heads, and powerful jaws, and live on smaller mammalia and birds. The family Otariidae (fur seal) is found along the Pacific coast south from Behring Strait. The carcajou, marten, polar bear, and arctic fox are common to the Palaearctic

¹Mr. A. Brabant, fur-trade commissioner for the Hudson's Bay Company, states that the finest furs are obtained in most densely wooded districts, and that depth of colouring and lustre of pelt increase in direct relation to degree of forestation because of shelter, shade, and better food. Skins from Labrador and British Columbia are preferred (see *Illustrated Canadian Forestry Magazine*, Toronto, December, 1922).

²This study purposely omits the order Ungulata. Wool is strictly not fur, but a fine curly hair. The buffalo are consequently not included. For a short sketch of the lives and habitat of fur-bearing animals, see H. Poland, *Fur-Bearing Animals in Nature and in Commerce* (London, 1892), E. Brass, *Aus dem Reiche der Pelze* (Berlin, 1925), Marcus Petersen, *The Fur Traders and Fur-bearing Animals* (Buffalo, N.Y., 1914).

³See *Atlas of Zoogeography*, Bartholomew's *Physical Atlas*, Vol. V, 1911, part II, f.

and the Canadian sub-region (Nearctic). The north temperate areas are the dominant fur-producing territories.

In the Nearctic zoogeographical region the more important fur-bearers¹ are found in the forest areas and along the shore line of the Arctic regions. The significant forest areas² stretch northwesterly across the continent following the general direction of the isotherms. As a result of variations in temperature and precipitation these areas shade on the north into the barren grounds and on the south into the plains. Geologically they include the southerly portion of the Precambrian formation with its numerous lakes and rivers and its irregular drainage system and the adjoining rich soils of the glacial deposits. For the purposes of this study it may be concluded that the fur-trade of North America is limited to definite areas—the Northern forests and the Arctic, the Pacific and the Atlantic littorals. Although fur-bearing animals are distributed over a much more southerly range, the element of temperature has made this territory much less important, especially from the standpoint of the production of the finer varieties of fur.³

§2. THE MODERN DEMAND FOR FURS

Fur-production in Canada has entered a new era. The new developments assumed greater importance toward the

¹For an excellent survey of the range of animals see E. T. Seton, *Life Histories of Northern Animals* (New York, 1909). See also Elliott Coues, *Fur Bearing Animals, a Monograph of North American Mustelidae* (Department of Interior, Miscellaneous Publications, No. 8, Washington, 1877); Bernard Rogan Ross, *A Popular Treatise on the Fur-bearing Animals of the Mackenzie River District* (Canadian Naturalist and Geologist, Vol. VI, 1861, pp. 5-36); Roderick MacFarlane, *Notes on Mammals collected and observed in the northern Mackenzie River District*; C. Mair and R. MacFarlane, *Through the Mackenzie Basin* (Toronto, 1908); E. A. Preble, *A Biological Investigation of the Athabaska-Mackenzie Region* (North American Fauna, no. 27, Washington, 1908).

²See *Atlas of Canada*, Ottawa, 1916, pp. 9-12, 17-20.

³In preparing this introduction I have been greatly indebted to the assistance of Mr. W. J. K. Harkness, of the Department of Biology, in the University of Toronto.

latter part of the nineteenth century, gathered force with the turning of the century, and reached a climax with the world war. We shall attempt an analysis of the important trends of this movement in the hope that some conception of future developments may be gained.

As an index of an important change, no writer on the subject fails to mention the rising price of furs, although few commodities present greater difficulties in a study of prices. Fur is a commodity which varies in size and quality with each species, with each animal, within each district, in the same season, in different seasons, with the trapper, and with the trader. The difficulty of determining a change in price is usually great. Nevertheless, attempts which have been made to show a rise in price have, in spite of innumerable difficulties, been decidedly convincing. Herr Emil Brass¹ has collected prices on the London fur-market for No. 1 muskrat from York Factory district from 1882 to 1910, showing a rise from 16 cents to 47 cents in 1909 and 87 cents in 1910. No. 11 mink for the same period and district increased from 73 cents to \$6.34. No. 1 dark red fox increased from \$3.11 to \$16.55; and No. 1 large lynx from \$4.87 to \$39.85. Prices of other furs have shown a similar tendency.² Australian opossum (Adelaide prime blue) increased during 1880 to 1910 from 16 cents to \$1.95; wallaby from 10 cents to \$1.70 (highest prices); kangaroo from 12 cents to \$1.45; wombat from 12 cents to 73 cents; native cats from 4 cents to 49 cents; bastard chinchilla from 73 cents to \$9.73; black fox (best skin) from \$632.70 to \$2628.00; sea-otter from \$584.00 to \$1703.33. During 1890 to 1910 Japan marten increased from 35 cents to \$3.81, Japan fox from 83 cents to \$4.05; raw Persian from \$2.05 to \$6.70; stone marten from \$1.43 to \$6.66; marmot (Orenburg) from 10 cents to 90 cents; and

¹Emil Brass, *Aus dem Reiche der Pelze* (Berlin, 1925), p. 437; also in J. W. Jones, *Fur-farming in Canada* (Ottawa, 1914), p. 216; and graphically in *Proceedings and Transactions of the Royal Society of Canada*, 3rd series, Vol. VIII, p. LXIX.

²Emil Brass, *op. cit.*, p. 438; J. W. Jones, *op. cit.*, app. X, p. 215.

from 1900 to 1910 Japan mink increased from 12 cents to 60 cents; Chinese weasel from 7 cents to 33 cents; skunk (the best lot) from \$2.07 to \$7.06. A comparison of prices during the war and the post-war periods shows an even more pronounced rise.¹ The various causes of the rise in prices represent the subject of this study.

On the demand side, fur is a commodity which enters into modern commerce because of its suitability as clothing. Its warmth-giving qualities render it especially valuable for peoples in the north and south temperate zones and the colder regions. The relative scarcity of the important small fur-bearing animals and the dense population of these areas, on the other hand, reduce the importance of fur as a product contributing to the total clothing supply. The development of textile industries, especially wool and cotton, as the staple clothing commodities has made fur a minor product. It has a decidedly limited use, and has developed as a subsidiary to the important articles of clothing. This subsidiary character of fur and its adaptation to limited demands has given it special significance as outer clothing in the decided seasonal character of temperate climates. Its use is largely limited to the winter seasons. It is especially adapted to outdoor wear in garments such as cloaks, which can readily be put on when needed or taken off when not essential to warmth, and muffs, scarfs, or trimmings which are supplementary to cotton or woollen garments.

With these limitations manufactured fur garments represent to the wearers an appreciable overhead charge. Consequently furs tend to be worn by more wealthy people. The supply of furs in spite of these limitations is inadequate to the manufacture of sufficient garments to meet the demands of a large population. Furs, because of their scarcity

¹See statistics of Hudson's Bay Company's auction sale prices, April, 1923, January, 1924, and March and April, 1924. Emil Brass, *op. cit.*, pp. 440-452. For prices on the Leipzig fur market, 1914-1920, *ibid.*, p. 439. For other price lists see Reports of St. Louis fur sales, Montreal fur sales, New York auction sales, Prices current of Hudson's Bay Company's fur sales, issued by P. R. Poland and Son, and C. M. Lampson and Co. sales.

and consequent expensiveness, are limited to a relatively small portion of the population. To a very large extent furs¹ have tended to become exclusively women's apparel, and the finer, more expensive, furs exclusively the apparel of wealthy women. Fine furs become more valuable because of their expensive character.

The demand for furs is located primarily in centres of population which support a large leisure class. These are areas with populations in which class distinctions have been built up as inherently a part of the social organization, or which have greatly increased the production of goods through new processes, as in countries recently brought under the sweep of machine industry, and in which a large surplus of goods exists because of improved technique or reduced consumption of a large part of the population. An important characteristic of these areas is the growth of large cities² made possible with the existence of a surplus of goods and necessitated by the new technique of machine industry and the factory system. Countries located within the temperate zones over which the Industrial Revolution has spread, including particularly Europe and North America, the southern portions of South America and South Africa and Australia, and countries which had built up an elaborate social organization, such as China and (in the pre-war period) Russia, are important consumers of furs. The more densely populated of those areas and the largest cities constitute the more important markets. The demand has increased tremendously with increasing population, increasing urbanization, and the spread of machine industry.³

¹The thesis worked out in Thorstein Veblen, *Theory of the Leisure Class* (New York, 1899), as to the position of women in the leisure classes, appears to be very much to the point with reference to this commodity. Similar conclusions are supported by W. Sombart, *Luxus und Kapitalismus* (Leipzig, 1913).

²See A. F. Weber, *The Growth of Cities in the Nineteenth Century* (New York, 1899), Ch. III, *passim*.

³Mr. J. W. Jones places great stress on the automobile as a factor in the increasing demand for furs. For mention of specific furs affected by the automobile, see A. Belden, *The Fur Trade of America* (New York, 1918), p. 223. Aviation has also had its effects. *Ibid.*, p. 181.

II. PRICES OF FURS

A general statement¹ of parallel figures for various furs over a series of years cannot be accepted as positive proof of absolute rise in price. Prices of furs have increased partly as a result of the general rise in the prices of all commodities, as shown, for instance, in the graph for wholesale prices on page 21. The marked rise of fur prices² during the war and post-war periods was partly the result of currency changes and general inflation.

Mr. Salter, in a study of prices³ of furs, has attempted an analysis of the situation to show the relative importance of factors of demand and supply and of a general rising price level. Recognizing the difficulty of using the price of one grade of fur as an index, he has attacked the problem by comparing the prices of a staple fur product (York Factory, No. 1 muskrat) and the average prices of muskrat, and also of fine fur (York Factory No. 1 dark red fox), with average prices of red fox. He has constructed index numbers of both prices of separate grades and average prices with the average

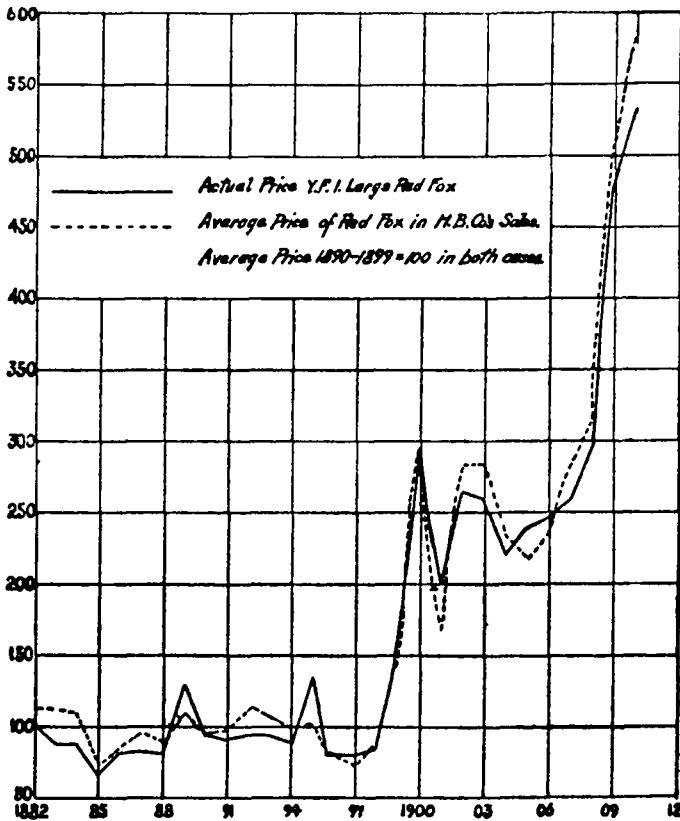
¹For a comparison of peak prices of various furs in 1875, 1913, and 1920, see Marcus Petersen, *Petersen's Fur Traders' Lexicon* (New York, 1920), pp. 82-5. Various references are given to prices of furs during the past two centuries and more, but the value of these price statistics for comparative purposes is greatly overemphasized. In most cases no account is taken of the general change in price levels. For a list of furs as compared in this way, see H. Lomer, *Der Rauchwarenhandel* (Leipzig, 1864), pp. 20-21. See also, for an extended discussion of long run factors determining fur prices, *ibid.*, pp. 94-100.

²See the rising prices on the Leipzig market from 1914-1920, to a very large extent the result of currency depreciation (E. Brass, *op. cit.*, p. 439).

³Mr. P. E. Salter has given a general description of the various factors which should be taken into account in the early part of his work. This includes references to sales organization, theories on fur production, fashions, substitution, and other details. A large portion of the work is statistical. Data on prices and sales are based entirely on his study, and no further reference will be given. This study is available for further consultation at the Department of University Extension, University of Toronto.

price of 1890-1899 as a base. A correlation of $+ .98$ has been found for the muskrat prices, and an equally close correlation for red fox prices is evident from the graphs 1 and 2. With this close correlation he has assumed a statement of average prices as a reliable guide for a study of the general trend. For this purpose he has taken the prices¹ of twelve important

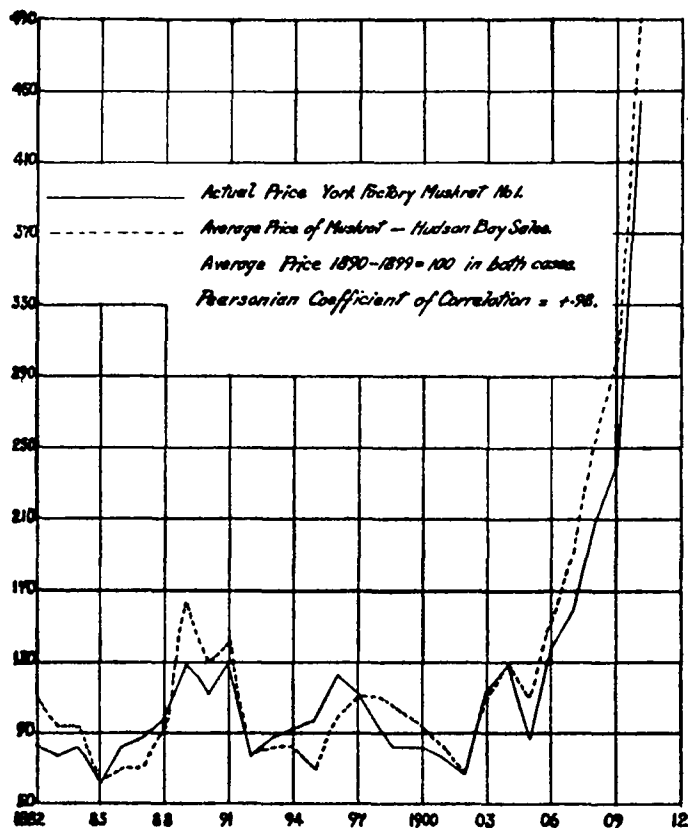
GRAPH 1



¹These prices are taken from Hudson's Bay Company's auction sales. The sales statistics also refer to the Hudson's Bay Company. See J. W. Jones, *op. cit.*, pp. 203-214.

Canadian furs for the period from 1857 to 1911—lynx, silver fox, red fox, marten, mink, fisher, muskrat, wolf, wolverine, skunk, land otter, and raccoon. To indicate the general trend he has combined the average prices of these twelve furs, and constructed index numbers with an average price for 1867 to 1877 = 100. This base corresponds to the base used in the Sauerbeck index numbers for wholesale prices. Since the Sauerbeck index includes the same period they have been used as an index of the general price levels (see

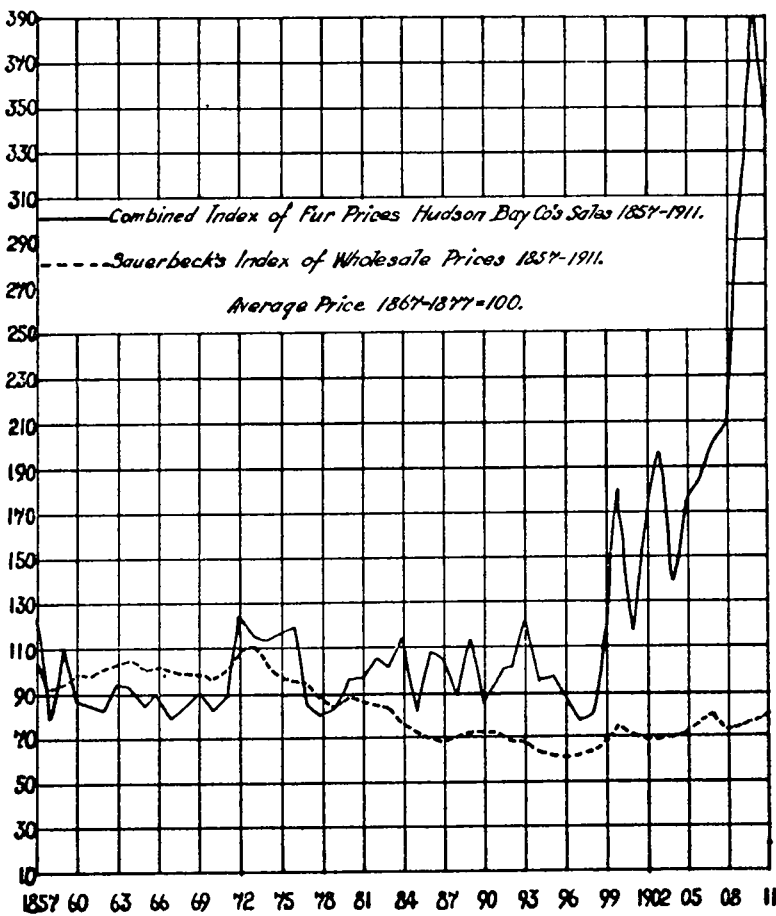
GRAPH 2



Graph 3). The graphs show quite clearly that fur prices as compared with wholesale prices begin to rise after 1880, and in a most striking manner after 1900. Since the turning of the century fur prices have increased to an unprecedented extent.

The general trend is shown in a decline from 1860 to 1871, a marked increase from 1872 to 1876, a period of relative

GRAPH 3

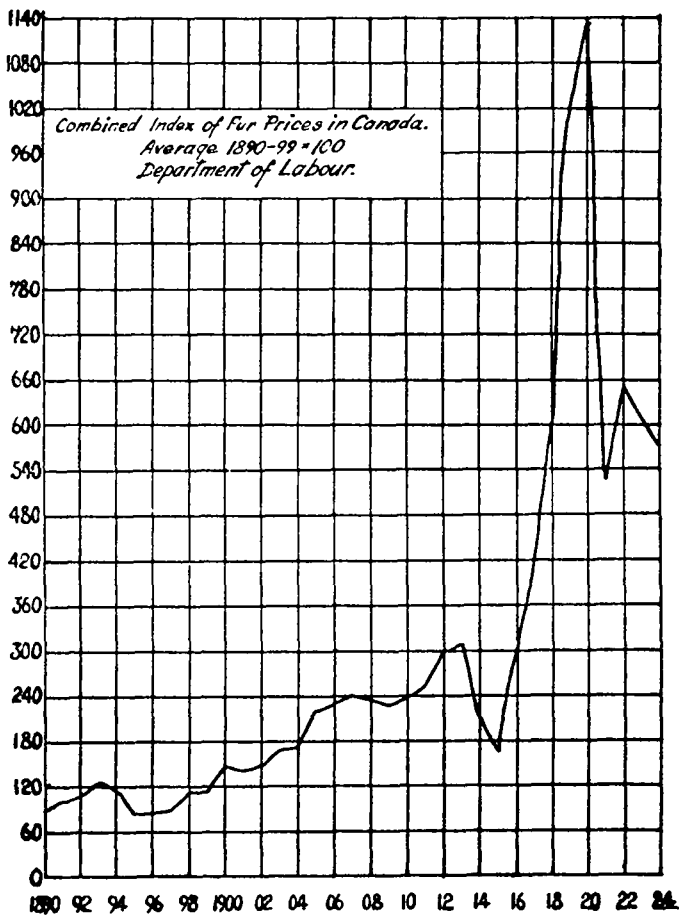


stability from 1877 to 1898, and a rapid increase from 1899 to 1910. These changes correspond to a period of rising wholesale prices from 1858 to 1864 and a decline to 1870, rising prices to 1873, falling prices from 1873 to 1896, and rising prices from 1897 to 1910. In the period from 1858 to 1871 an increasing supply of fur, following the opening of new territory to competitors, was apparently responsible for a decline in price. Increase in wholesale prices in the succeeding period was apparently a part of the phenomenon responsible for the rise in prices of furs. The period of stability and rapidly rising prices during the later years was the result of decreasing supply and increasing demand. A further important characteristic of fur prices may be noted in relation to wholesale prices. Fur prices are unusually susceptible to a change in the price level—a characteristic which is most striking after 1900. A period of prosperity is the cause of a marked increase in prices, and a depression is the cause of a marked decline. Fluctuations are unusually violent, and react immediately to changes in business conditions.

Similar tendencies are difficult to detect in the period following 1910. Mr. Salter has taken four furs—mink (dark), muskrat (best winter and fall), raccoon, and skunk (black, Canadian)—for which prices have been given by the Department of Labour for the period 1890-1924. A combined index number has been constructed with the average 1890-9 = 100 (see Graph 4). Wholesale prices continued to rise steadily from 1910 to 1914, very rapidly to 1920, declined to 1922, and rose steadily to 1924. Fur prices rose steadily to 1913, declined rapidly to 1915, increased to a very marked extent to 1920, declined to 1921, increased in 1922, but fell off in 1923-24. The decline in 1915, the rise in 1922, and the decline in 1923-24 were points of divergence from the trend of wholesale prices. The variation in 1915 was the result of the disappearance of an important part of the European market. The fur markets in the later post-war years have failed to reach a position of stability as a result of general

economic conditions and the position of Russia as an important producer. The effects of the war on the fur-trade preclude an analysis as to general trends. This index number of four furs, all of which are staple furs, and two of which are relatively coarse furs, shows more closely the relation between fur prices and business fluctuations. The

GRAPH 4



index number (1857-1911) included, in addition to these four staple furs, a large percentage of fine fur. As a result this index number fluctuates more rapidly and responds more quickly to changes in business conditions. The later index number (1890-1924) follows the general trend of wholesale prices much more closely.¹

From a general survey it may be tentatively concluded (1) that the change in price level has been due in the long run to a decrease in supply, especially since 1900; (2) that demand has also increased since that date; (3) that short run changes in demand are effective in producing price changes of all furs, but especially of fine furs; (4) that long run changes in demand and supply have been most effective in the prices of fine furs; (5) that the business cycle is an important factor in short-run changes in price level.

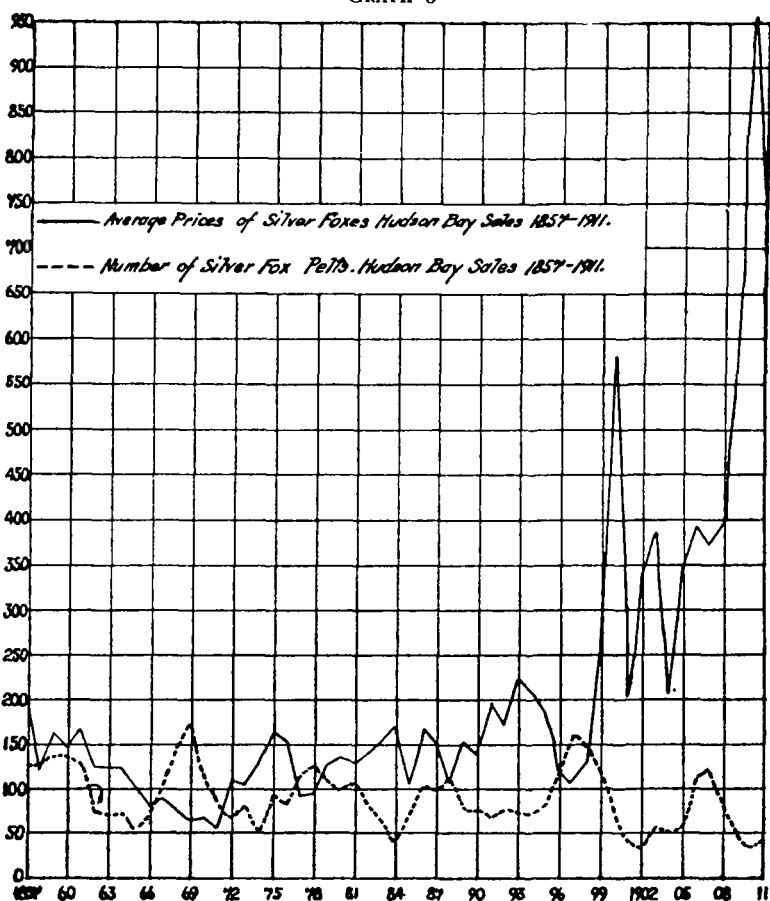
The value of these tentative conclusions may be tested with reference to specific furs. The demand for furs has been described² as the result of several factors. "The qualities which make a fur desired depend first of all on the nature of the fur itself. Pretty colour, lustre, thickness, softness, length, uniformity and regular fall of the hair are the chief points to be considered. While the leather part of the hair is of secondary importance in the evaluation of a fur, it must possess strength, lightness of weight, and when properly dressed would be supple and have a certain firmness or 'feel'. The abundance or scarcity of a fur-bearing animal also determines the value of the fur. . . . A third factor which has an influence on the value of furs is the prevailing style of fashion."

¹A suggestion is made that the prices of fur collected for the report on wholesale prices to 1917 were inadequate in representing the price situation of the fur market. Muskrat (best winter and fall) was a lower grade than spring. Raccoon and skunk were staple furs, but not representative of northern areas. Mink was the only fur which might be regarded as a higher priced fine fur. The inclusion of marten and fox would have done much to offset these tendencies. The present wholesale prices on fur might be improved by the inclusion of other fur prices.

²See W. E. Austin, *Principles and Practice of Fur Dyeing* (New York, 1922).

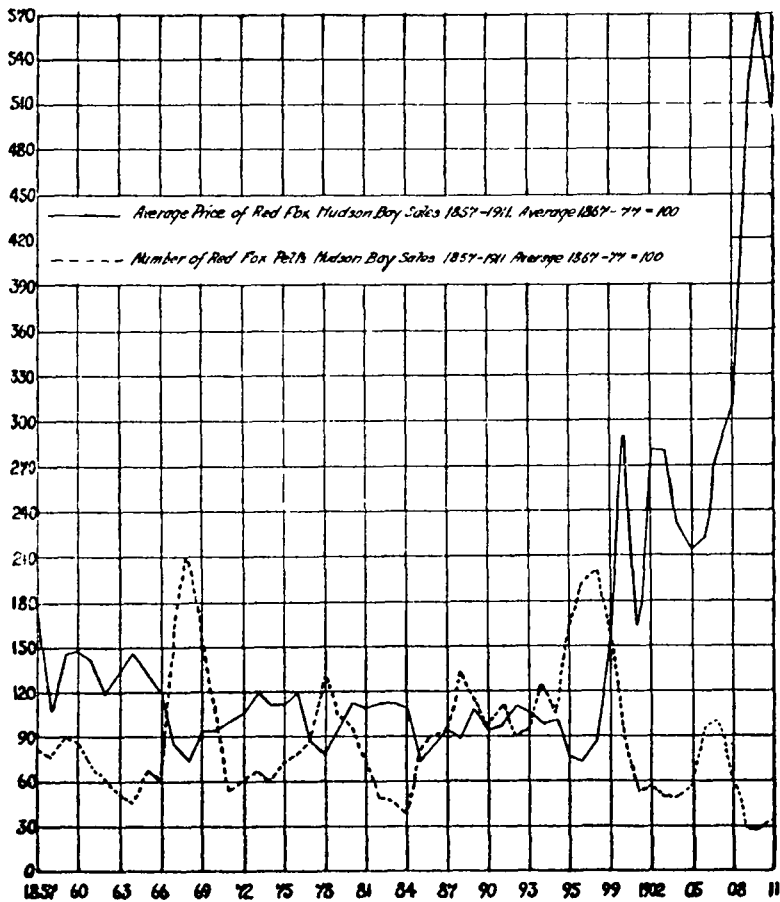
Silver fox has been regarded as a fur of the highest value. Mr. Salter has shown graphically the relation between the numbers of silver fox sold and the price level during the period 1857-1911 (see Graph 5). The conclusion immediately suggests itself that the factor of supply is important. An increase in supply is represented generally by a fall in price and a decrease in supply by a rise in price. The highest

GRAPH 5



points in numbers sold occur in 1860, 1869, 1878, 1888, 1897, and 1907, and the lowest points in prices in 1871, 1877, 1885, 1888, 1897, 1901, 1904 and 1907. The lowest points in numbers sold occur in 1865, 1874, 1884, 1891, 1902, and 1910, and the highest points in prices in 1861, 1875, 1884, 1893, 1900, 1903, 1906, and 1910. The nine to ten year cycle in production has a noticeable effect on prices.

GRAPH 6

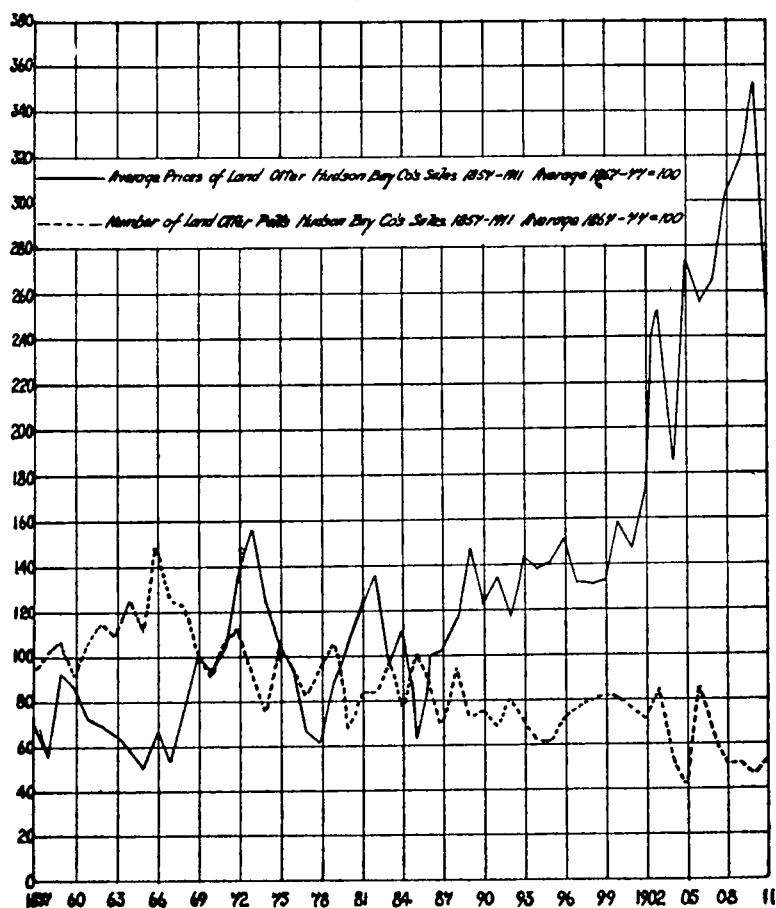


Supply, as shown especially in the peak years of 1869 and 1897, affected prices. Throughout the period the total supply has changed slightly. A possible decline toward the end of the period should be offset in the succeeding years by an increase from fox-farming. Fluctuations were even more violent than in the case of the combined index. Silver fox is essentially a luxury product responding with unusual rapidity to changes in economic conditions. The general tendency appears to show an increasing demand, especially since 1900. This tendency was fostered by the difficulty of making substitutes, since the silver hair cannot be imitated, by the increasing use of substitutes for other furs, and by inherent scarcity and expensiveness. Fashion probably exercises a less direct effect on prices of silver fox. The importance of this fur to Canada is partly indicated by the effect of a fluctuating supply of Canadian furs in the Hudson's Bay Company's sales and its effect on prices.

The close relationship between the silver fox and the red fox warrants a consideration of the latter. Mr. Salter has found a very high correlation of $+ .948$ in prices, a correlation of $+ .74$ in numbers (see Graph 6). The high and low points of production correspond with low and high points in price level as in the case of silver fox. On the other hand, there are important differences. Supply fluctuated much more widely than with silver fox. Throughout the period the tendency toward a decline was more pronounced. But in spite of much greater fluctuation in supply, prices fluctuated much less widely. Prices tended to decline to 1897, but rose rapidly after that year. Price fluctuations correspond much more closely to wholesale prices. The causes of the variations include the general character of red fox as a more staple fur than silver fox, and the greater possibilities of substitution through imitation. Red fox is less violently affected by business conditions. Fashions have a more important influence. But it still remains a product with similar tendencies to those shown in silver fox. It is again an important Canadian product.

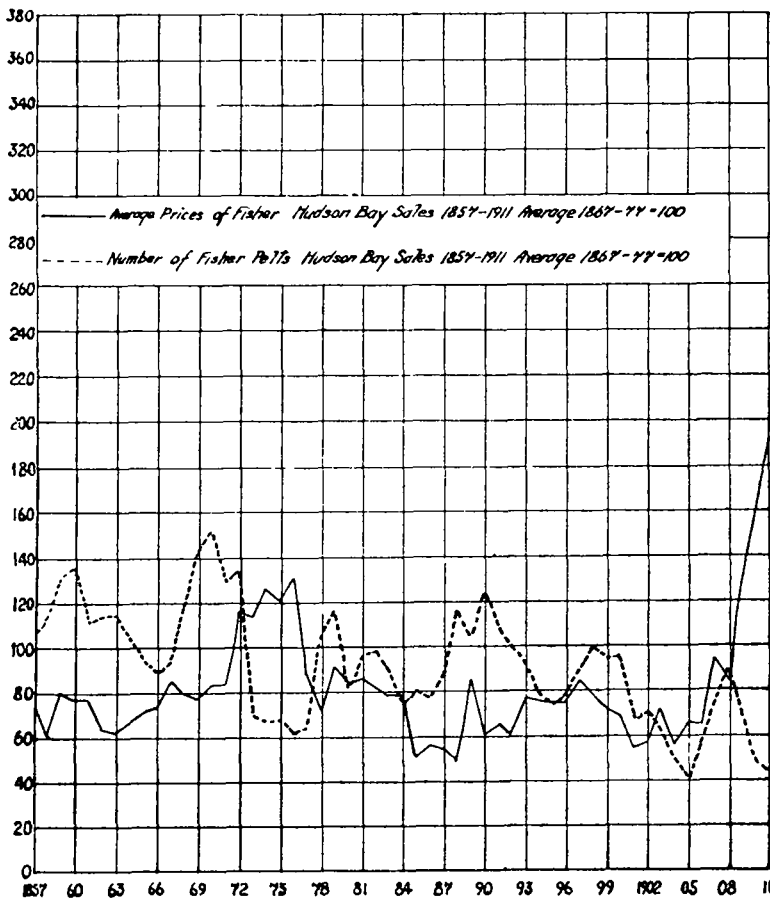
Land otter is a species of fine fur which shows tendencies similar to fox (see Graph 7). The number of land otters sold through the Hudson Bay Company's auction has steadily declined from the high point of 1866. This decline has been accompanied by varying fluctuations of approximately three years' average. The relation between fluctuations of prices and production is evident, but not obvious. Prices are

GRAPH 7



influenced throughout the period by declining supply, but other factors are important. Declining supply becomes more obvious after 1888. Rising prices become conspicuous from the same date. In the period prior to 1890 prices reached the highest points in 1859, 1873, 1882, and 1889; and the lowest points in 1865, 1878, and 1885. These fluctuations are apparently explained by changes in fashion, and possibly

GRAPH 8



by the general fur situation. After 1890, and especially after 1900, otter follows fluctuations similar to those of red fox. Its increasing scarcity and its value as a fine fur have placed it on a basis in which changes in economic conditions are reflected sharply in prices. The tendency of land otter to take on similar characteristics to those of fine furs is significant in the general trend of fur prices. It becomes less subject to the influence of fashion as it becomes more scarce. The prices of sea otter throw very little light on the general problem. The marked increase in price and practical extinction of the fur suggest problems of the future following the evident decline in more valuable furs. Disappearance and scarcity of most valuable furs leads to an increase in demand for furs only less valuable.

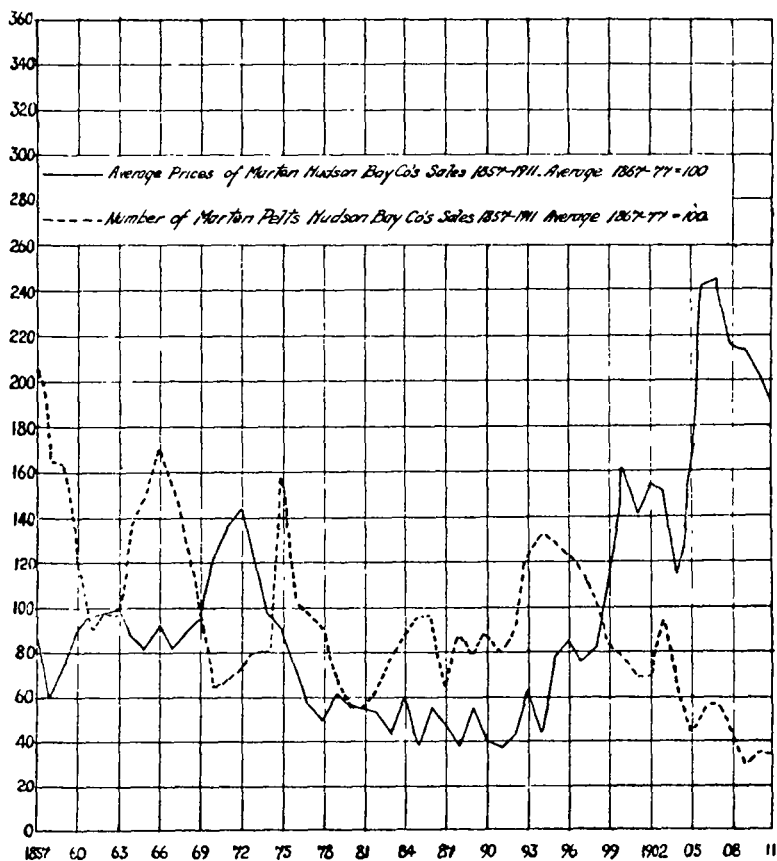
Fluctuations in the supply of fisher follow definite cycles of nine and ten years (see Graph 8). Price fluctuations are affected by these supply cycles, but demand is again important. From the highest point of production in 1870 the supply has steadily declined throughout the period, reaching the lowest point in 1905. Prices, on the other hand, have also declined from the highest point in 1876 to 1904, increasing rapidly from that date. Fluctuations show a striking similarity to those of otter. On the other hand, price changes were much less pronounced as a result of the definite cyclical supply. After 1908 fisher prices increased rapidly, and the fur was apparently added in a more definite fashion to the list of furs which became expensive through scarcity.

Marten (see Graph 9) is also a fur which has definite cycles of production of nine and ten years, the peak of production coming three and four years earlier than fisher,¹ and two or three years earlier than red fox and lynx. In the earlier part of the period 1857-1911 prices are affected closely by supply. In the later period the influence of changes in supply are less conspicuous. Throughout the period numbers decline steadily, and especially after 1894.

¹E. T. Seton has stated from this evidence that lynx and fisher are enemies of marten. See his *Life Histories of Northern Animals*, p. 919.

Prices declined from a high point in 1872 to 1894, and increased rapidly after that date. From 1894 to 1911 fluctuations were similar to those of land otter and red fox, although marten prices were much steadier than either of these furs. During the earlier period marten prices responded more quickly to changes in supply, and followed very closely the price fluctuations of fisher. Throughout the period marten and fisher prices have a low correlation of $+ .39$.

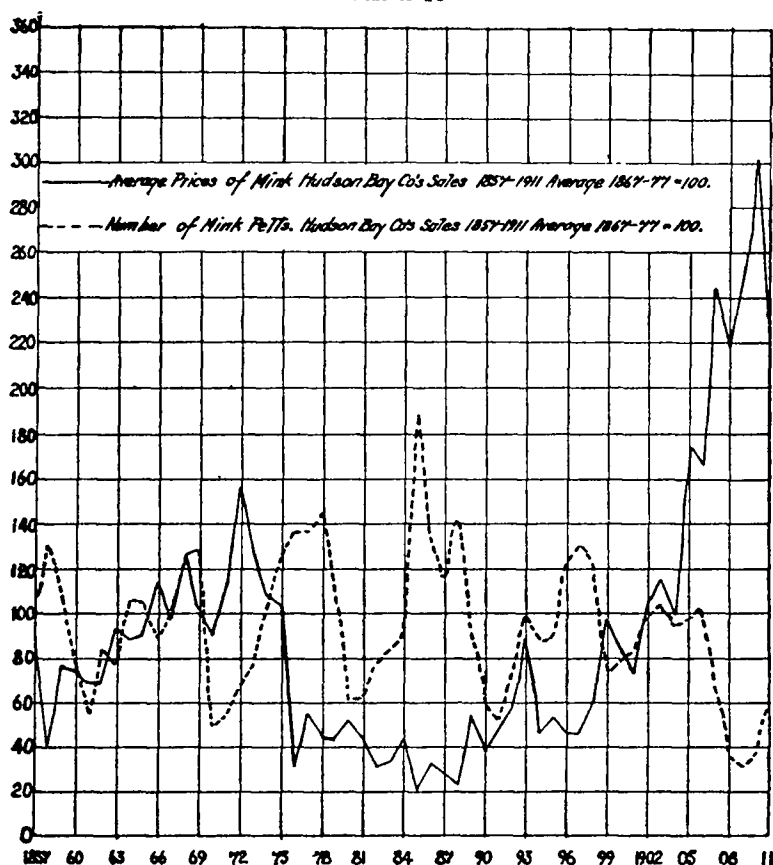
GRAPH 9



Marten is essentially a staple fine fur, and consequently the pronounced rise after 1894 and 1897 was a part of the general movement. On the other hand, neither the rise was as rapid nor the fluctuations as violent as in such expensive furs as red fox and silver fox.

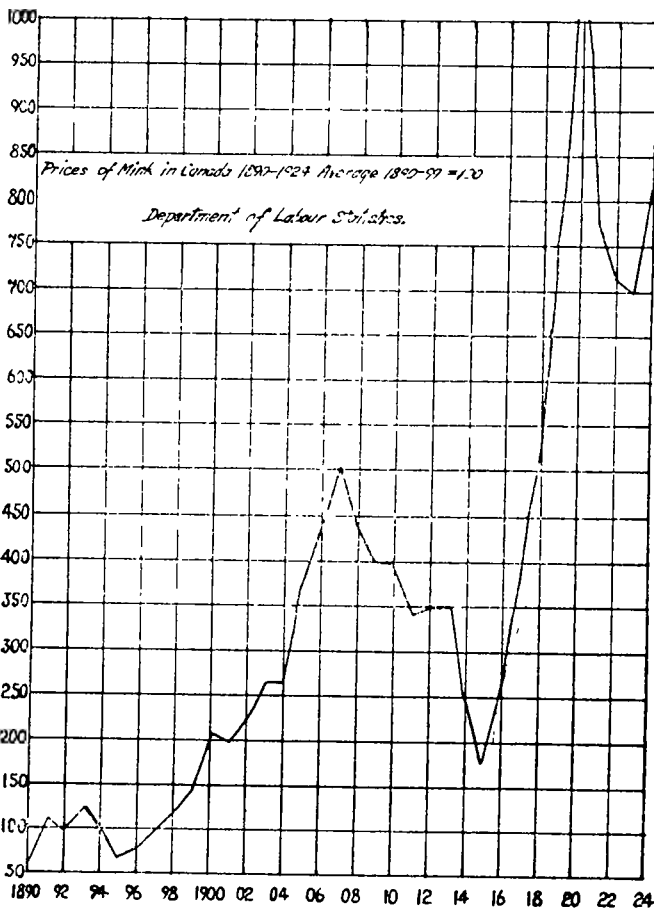
Mink (see Graph 10) is in many ways closely dependent on fluctuations in marten. Prices of marten and mink have a correlation of $+0.882$. Supply fluctuates with a seven to

GRAPH 10



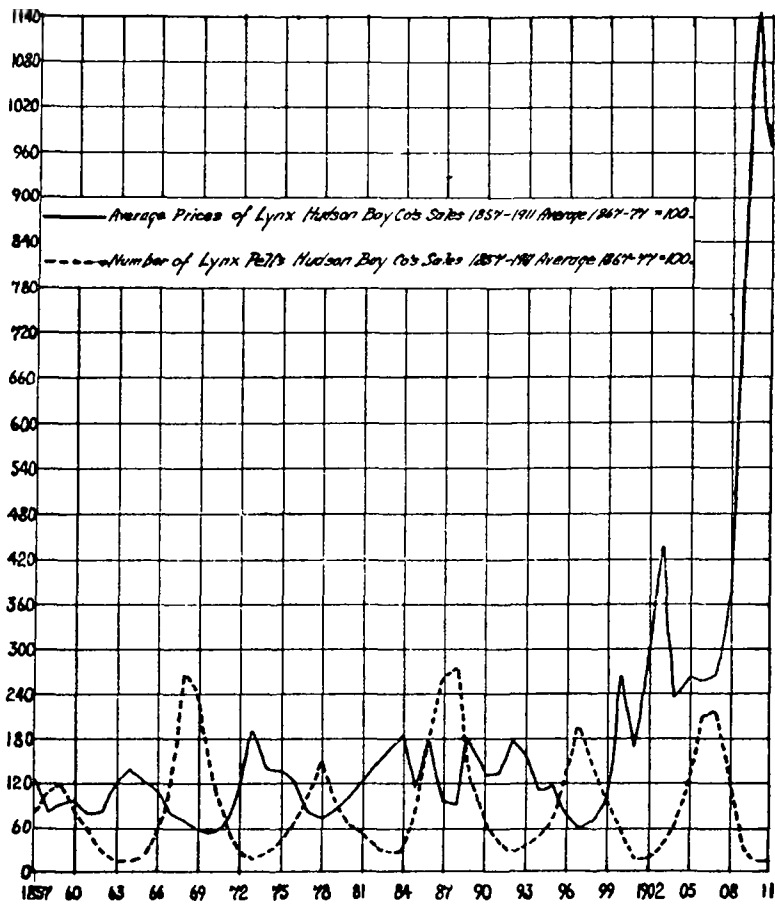
twelve year cycle, the peak usually falling two or three years later than marten. Sales tend to increase to 1885 and to decrease after that date, reaching the lowest point in 1909. Prices follow the trend shown with marten as is indicated in the high correlation, beginning at the highest point in 1872, declining more rapidly because of the greatly increased supply in 1886, but rising generally after 1894. Fluctuations

GRAPH 10



were not as marked as in the case of red fox, but they reflected changes in economic conditions in a similar fashion. The relative stability of mink prices is shown in a correlation of $-.49$ between the number of mink sold and prices during the period 1900-1911. Mink is also a staple fine fur caught over wider areas than marten. During the period 1910 to

GRAPH 11



1924 mink prices declined to 1915; they increased rapidly to 1920, declined to 1923, and rose in 1924.

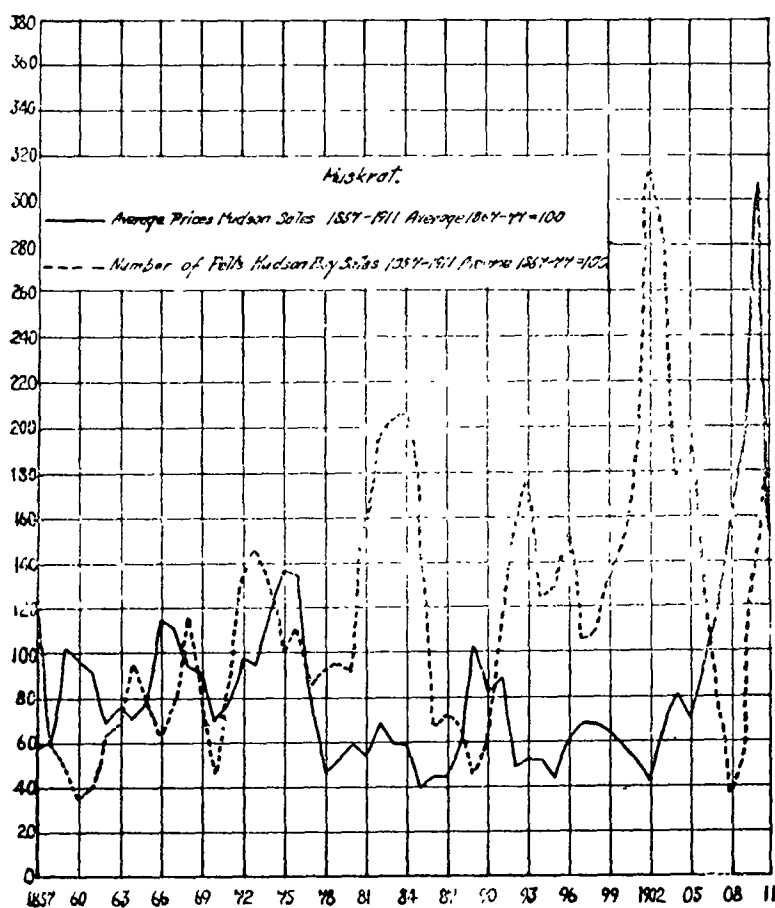
Lynx (see Graph 11) is the classic instance of cyclical production, because of its dependence on the rabbit. Its high points of production correspond with a nine and ten year cycle, and follow that of fox. The coefficient of correlation between the numbers of lynx and fox sold is $+.695$. The highest points were reached in 1868 and in 1888, the smaller peaks occurring in 1858, 1878, 1897. Throughout the period a slight tendency toward a decline is evident. Fluctuations in supply are reflected directly in prices. The years 1861, 1886, 1889, 1894, 1901, and 1904 appear to show the influence of other factors. As with other furs, the rise after 1900 becomes most prominent, and supply appears to be of less effect. The coefficient for the whole period (1857-1911) between numbers and prices is $-.28$, and for the period 1857-1900 is $-.49$. Prices of lynx follow very closely prices of red fox, giving an unusual coefficient of $.98$. The conditions of demand for the two furs are undoubtedly similar. Both furs are in demand for similar goods—scarves, muffs, and trimmings.

The furs hitherto discussed are generally described as fine furs. Prices are, as a rule, at a high level, and the animals are caught in all years. A marked increase in price will affect the supply to a slight extent. Greater efforts may be made to secure a larger number by trapping, and more trappers may concentrate on these furs; but on the whole the increase will not be pronounced, since these furs are the occasion for most of the trapping activity in any case. A discussion of muskrat and skunk as animals in which a rise in price may lead to a marked increase in supply should give interesting results. Moreover, these furs become increasingly the basis for imitations of the more expensive furs.

Muskrat accordingly has a cyclical production of approximately ten years (see Graphs 12A and 12B). The high points of production occur, however, at points of low production for lynx and other animals. High prices and scarcity of finer furs

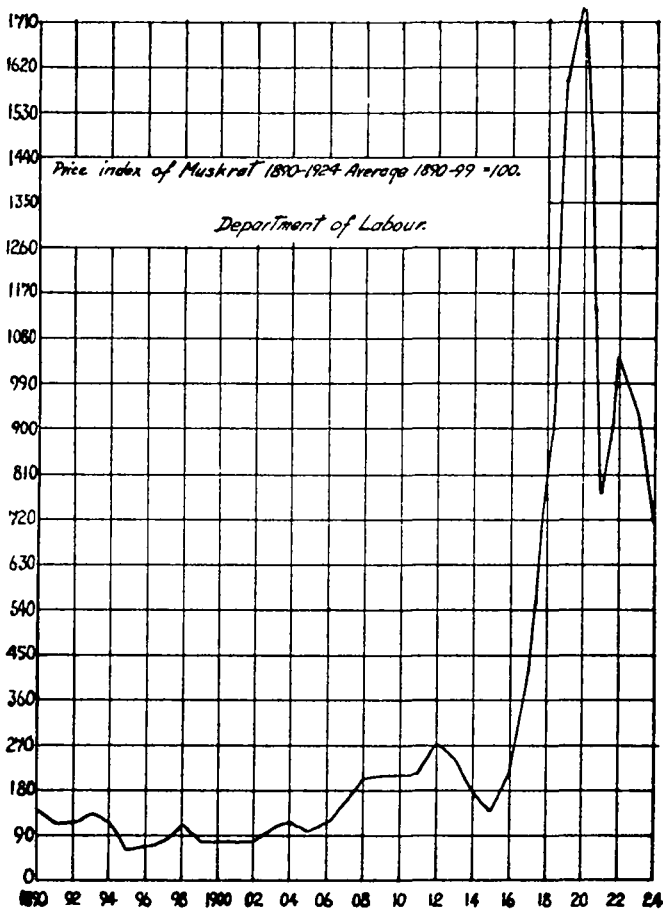
lead to an increase in the demand for muskrat, and to an increase in production. The general tendency of sales is decidedly upward—an indication not of increasing numbers, but of increased trapping following the rise in price and scarcity of finer furs. Decline in production conversely follows an increase in the sales of other furs. The natural cycle for muskrat, on the other hand, may follow the cycle

GRAPH 12A



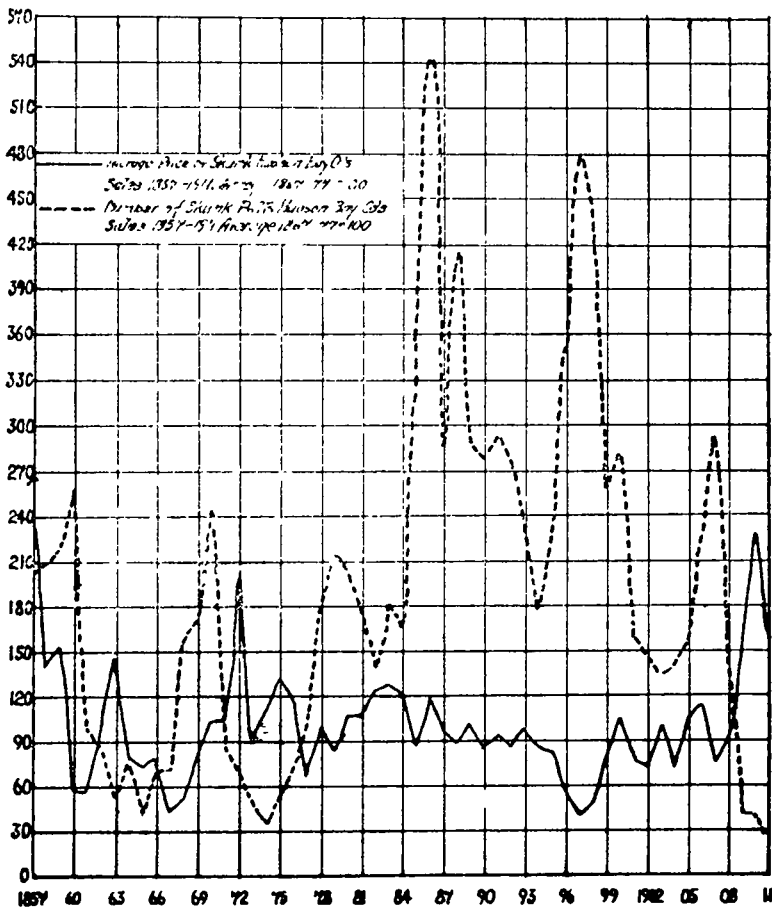
for other animals inversely—a marked increase in muskrat population occurring during a period of decline for other animals. Muskrat prices are also related to the prices of other furs. A marked increase in production is accompanied by a fall in price and a decline in production by a rise in price. A cycle in which increasing supply leads to decreasing price and in turn to a decreasing supply and a rising price,

GRAPH 12B



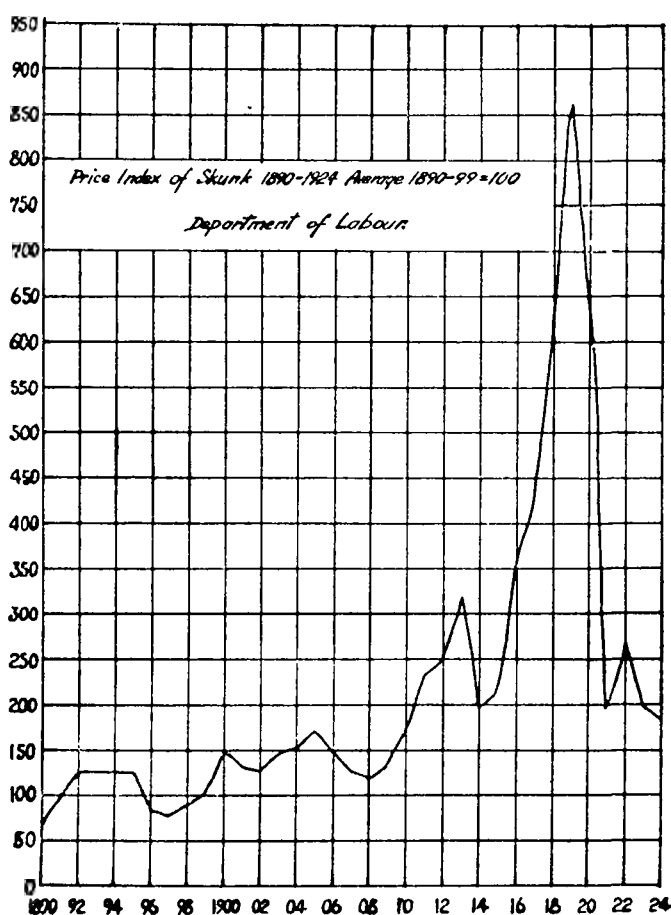
followed by an increase in supply, appears to be evident. During the period 1910 to 1924 muskrat prices appear to have fluctuated in the manner characteristic of fur prices in those years. The increasing importance of muskrat in the manufacture of substitutes for more expensive furs has led to marked increase in production and to a general tendency toward higher prices.

GRAPH 13A



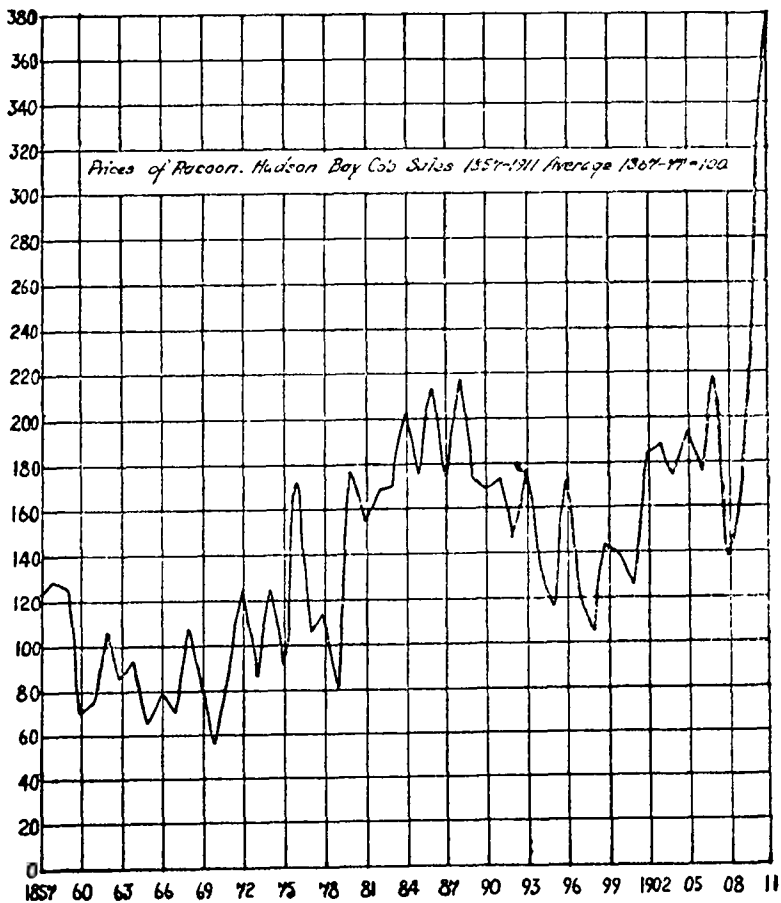
Skunk (see Graphs 13A and 13B) has a cyclical production of nine to ten years in the later years corresponding closely with lynx. Production increased to 1886, but fell off in later years, especially after the high point in 1907. Prices fluctuated with supply, but not in the pronounced fashion which might be expected from marked increases in production. Prices

GRAPH 13B



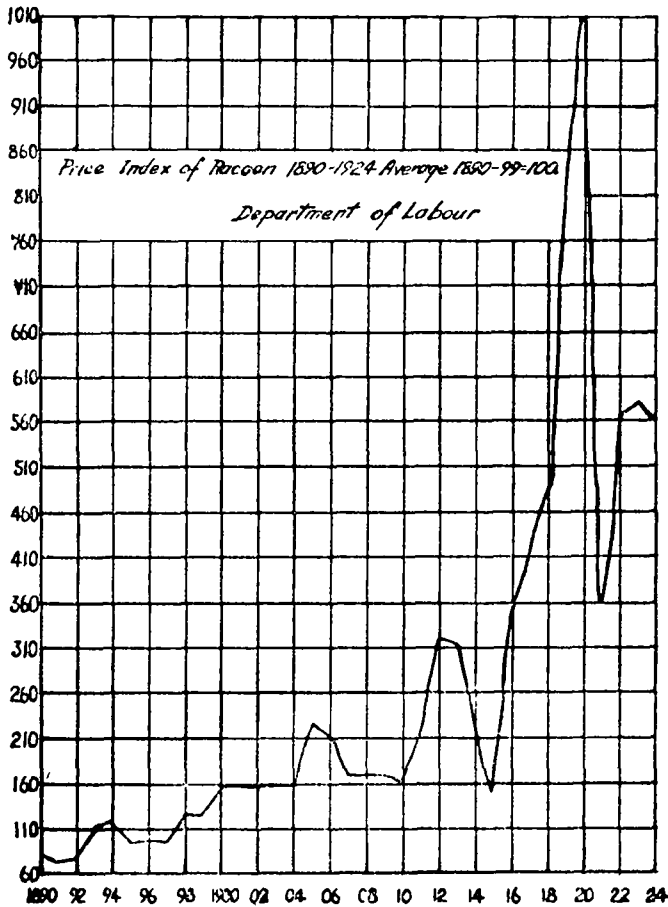
declined from the highest point in 1872 to the lowest point in 1898, and rose steadily to 1907 and rapidly after that date. In the period after 1910 prices followed a trend similar to other furs. Skunk is a fur which came rapidly into prominence as a staple product following the rising prices of finer furs and the increasing demand for furs. As with other furs, evidences of a decline are apparent.

GRAPH 14A



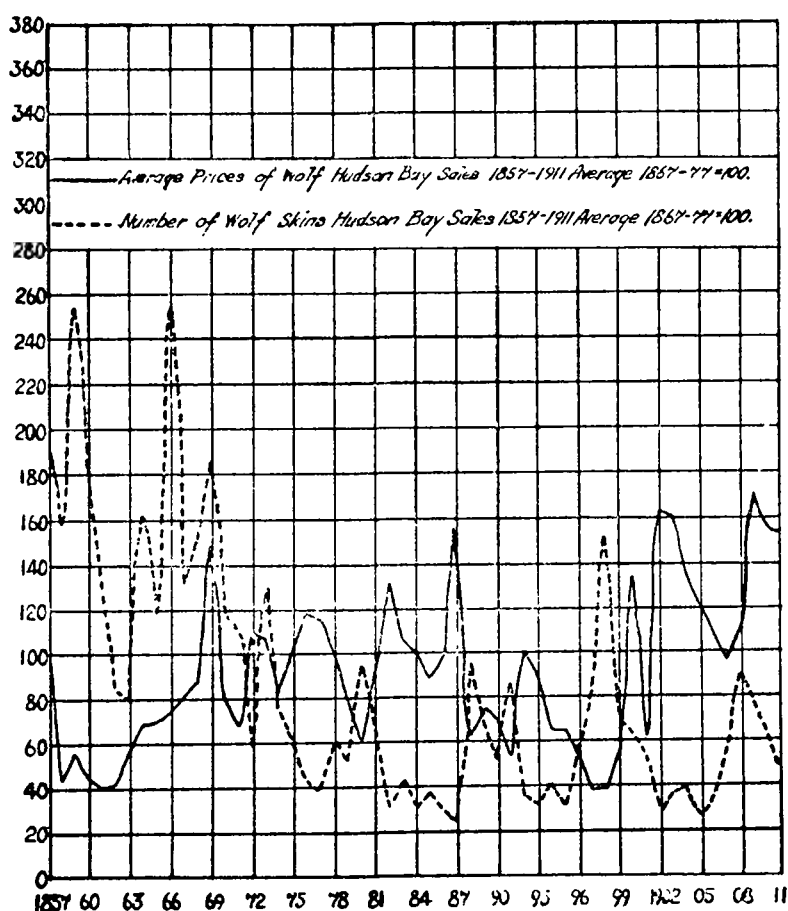
Statistics of the supply of raccoon (see Graphs 14A and 14B) are not adequate to a careful study. Price fluctuations are unusually rapid and abrupt. Prices rise steadily to a high point in 1888, decline to 1898, rise to 1907, and show the usual fluctuations resulting from business conditions. The rise is unusually rapid from 1908 to 1911. During later years, 1910-1924, prices followed the general trend of other furs.

GRAPH 14B



Wolf skins (see Graph 15) show a tendency to decline from highest points of sales in 1859 and 1866 to 1905. Production follows a nine and ten year cycle. Prices are affected closely by fluctuations in supply. On the whole, prices have remained unusually stable as compared with other furs even after 1900. Wolf is not a fine fur, and being of a coarse hair,

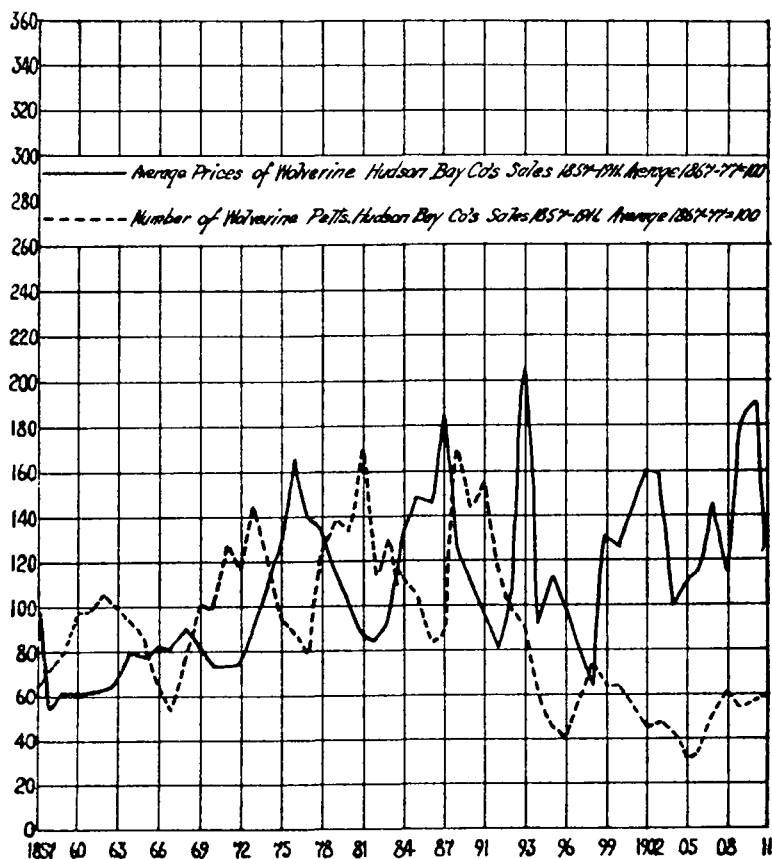
GRAPH 15



more difficult to adapt to imitations, it has not entered the general movements of furs to a pronounced degree.

Wolverine (see Graph 16) is also a coarse fur, in demand largely among Eskimos and trappers rather than in the fine fur market. Supply fluctuates with eight to ten year cycles, and prices change in directly opposite fashion. The supply, on the whole, has declined. Prices have risen throughout the period. The rise in price in the latter part of the period

GRAPH 16



corresponds closely with wolf rather than other furs. The two prices have a correlation of $+ .60$.

The evidence regarding the change in the price level of furs since 1857 may be briefly summarized in the accompanying chart (Table A). With all furs the tendency toward a decrease in sales after 1900, and the tendency toward higher price levels after that date, is shown in the grouping of minus signs for sales and plus signs for prices. Throughout the period large sales tend to be grouped about a ten year cycle, 1857-60, 1866-70, 1878-9, 1884-8, 1897-8, 1907-8. Low prices are significant, 1858, 1867-71, 1878, 1885, 1897, 1904, and 1911. After 1900 prices fluctuate much more widely, indicating that supply occupies a relatively less important position as a determining factor. Low sales are grouped about the periods 1861-5, 1870-4, 1880-4, 1891-2, 1901-2, 1905, 1909-10, and high prices are pronounced in 1863-4, 1872-3, 1893, 1900, 1903, 1910. Again, after 1900, high prices are much more conspicuous and less closely related to supply. The long run situation appears to show a decline in production after 1900, but of much greater importance, a marked increase in demand. Short run tendencies, the result of changes in fashion and of business fluctuations, become increasingly important with rising prices, but, on the other hand, the effects of these fluctuations on the increasing values is less pronounced.

Further light is thrown on the situation through reference to individual furs. Evidence of a rise in prices is most conspicuous for the rarest and most expensive furs, as shown in silver fox and red fox. Later, however, the rise becomes conspicuous for the more common fur, such as muskrat and skunk. Already it might be said that these have ceased to be recognized as common fur.

The significance of this situation to Canada cannot be overemphasized. A study of Hudson's Bay Company sales and prices has specific bearing on Canadian production. The period under consideration was characterized by increasing competition, and it cannot be urged that these sales repre-

TABLE A. CHANGE IN PRICE LEVEL OF FURS

SALES	PRICES
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[illegible]

TABLE A (C. nt)

	SALES											PRICES											
	Lynx	Red fox	Silver fox	Marten	Mink	Fisher	Land otter	Muskrat	Wolverine	Wolf	Skunk	Lynx	Red fox	Silver fox	Marten	Mink	Fisher	Land otter	Muskrat	Wolverine	Wolf	Skunk	Raccoon
1886				+							+												
1887																				±	±		
1888	±	+	+						±	+							±	+					±
1889								±				+					+	+	+				
1890							+																
1891						±															±		
1892												+								+			
1893								+					+	±		+			±				
1894				±																			
1895																							
1896									±						+		+						
1897	+		±		+						±	±	±		+				±				
1898		±				+			+	±						+	+		±				
1899																+							
1900													±	+						+			
1901																							
1902			±					±					±		+				±				
1903				+	+						±	±	±			+		±	+				
1904																							
1905						±	±		±	±							+						
1906														±									
1907	±	+	+	+							+			±								+	
1908						+		±	+														
1909					±														±	±			
1910		±	±										±	±		±		±			±		
1911					±		+			±						±					±		

+ High points of sales and prices.
 ± Highest points of sales and prices.
 - Low points of sales and prices.
 = Lowest points of sales and prices.

sent a monopoly condition controlled by the Hudson's Bay Company. The close relation between prices and supply throughout the period illustrates Canada's importance as a producer of these furs. Since the furs under consideration are primarily fine furs dependent for production on a north temperate climate, and on large unsettled areas, Canada has found herself in an unusually fortunate position.

On the other hand, new problems have arisen. Rising prices have been responsible for an increase in competition in the fur-trade, for an increase in trapping, and for destruction of the animals concerned. These problems were seriously enhanced during the unusually high prices of the war period. Larger numbers of competitors and trappers became interested in furs, with far-reaching results. On the whole, a period of rising prices has been responsible for increased attention to fur-farming, to new regulations for the conservation of fur-bearing animals, and to greater attention to the fur industry. The period of uncertainty existing at the present time has been partly a result. The period was responsible for a hastening of the spread of western civilization among more primitive tribes. The problems arising therefrom have occasioned new regulations for the protection of the Indians.

Undoubtedly fur prices have risen, but the rise attributed to the whole period is most characteristic of the period after 1900, and in reference to the most expensive furs.

III. THE PRODUCTION OF FURS

§1. CONSERVATION

The rise in world prices and the increasing demand for fine furs has led to the wholesale destruction of important fur-bearing animals. In all countries this tendency has led to regulations directed to the conservation of these animals, and has become especially noticeable since 1900. It is proposed to give considerable attention to the extent and character of these regulations in Canada,¹ as a basis for an appreciation of general world tendencies.

Governmental regulation of the production of furs has certain inherent difficulties. Furs are obtained over wide areas. They are unusually light and valuable. The animals may be caught, and the furs transported over long distances, without detection by the authorities. Animals which need protection are scarce, their furs are valuable, and they may be caught easily. A constant temptation exists to violate regulations prohibiting capture. Moreover, protection renders the furs more valuable, increases prices, and provokes a situation in which the temptation toward violation is more conspicuous, and the necessity for rigid protection more urgent. Protection has developed under conditions in which improved transportation facilities have made its enforcement more difficult, and in which improved methods of trapping and higher prices have made enforcement increasingly necessary.

The growth of regulative machinery has been dependent on the development of administrative bodies in general.

¹Mr. H. E. Dougall, in a study on "Government regulation of the fur-trade", has discussed the Canadian situation in considerable detail. The facts presented herewith are based largely on his material. The work which he has done is available on application to the Department of University Extension, University of Toronto.

During the period of company control enforcement of regulations restricting production was carried out with greater effectiveness. But even with effective monopoly control considerable evidence exists to show the difficulties of limiting production. Indian trappers were spread over wide areas in no immediate contact with the posts, and regulations were enforced with difficulty. Price adjustments were in part effective in concentrating the attention of trappers on certain animals. Refusal to purchase furs meant not restriction of production, but the use of these furs by the Indians for clothing. Evidence also shows that the company found it difficult to enforce its regulations on production because of the lassitude of the post managers. This was shown as clearly in the English period as in the French régime.

With the increase in settlement, and the development of transportation facilities, monopoly control of production became increasingly difficult, and began to break down. This was especially the case after the creation of the Dominion of Canada, with its federal structure, in 1867. No mention is made of the fur-trade in the British North America Act, and it has fallen to the separate provinces to design regulations. Regulations which had previously been enforced over a vast area by a central authority were now divided among the newly created provinces. In the older provinces of Ontario and Quebec, and in the maritime provinces, settlement had begun much earlier, and regulations of the fur-trade had naturally been worked out and elaborated at an early period.

Regulation followed the sweep of economic development and settlement. The necessity of protection began at a much earlier date. Protection was essential for animals which were easily caught, which produced valuable fur, which increased slowly, and consequently tended to disappear. In New Brunswick beaver were first fully protected, with a fine of \$20 to \$50 for any infringement, for two years after March 20, 1897. This provision was extended for another two years in 1899, and for various intervals thereafter until

1913. In that year permission was given for the trapping of a limited number of beaver, and a royalty of \$2.00 was charged on each skin. After July 1, 1916, prohibition was continued at various intervals, and trapping of beaver is at present prohibited to November 1, 1927. In Nova Scotia, with consolidation of the game laws in 1896, beaver was protected to 1900. Open season was permitted after that year in the period from November to March. In 1903 full protection was granted, with a penalty of \$100 for violation. In 1905 otter was given full protection until 1910, but the Act was repealed in 1906. In 1909 marten was given full protection.

Quebec has found it necessary to adopt similar measures. In 1899 the province was divided into two zones, (1) all the province, excluding the counties of Chicoutimi and Saguenay to the east and north of the Saguenay river; (2) parts of the counties not in zone 1. This arrangement permitted special protection in Chicoutimi and Saguenay. In zone 1 full protection was given to beaver until 1902. In 1906 protection was extended until 1912. Beaver have since been trapped for the benefit of the Crown in cases where their activities became destructive to property. Protection also has been given for the black bear. The zone system has been an interesting example of a method by which allowance could be made for climatic differences which exist in a large area. In Ontario beaver and otter were protected from 1898 to 1900. Beaver protection was later extended to 1905 and to 1910 and 1916. In 1911 permission could be granted for the destruction of beaver in cases where they were the cause of considerable damage.

Manitoba prohibited the trapping of beaver in 1898, and included otter in 1900. This provision was relaxed in 1913. In Saskatchewan regulations were enacted in 1905 prohibiting the trapping of beaver until 1915. In 1912 the regulation was extended to 1920. This was modified in 1916 by permission to trap beaver north of the Churchill River. At present protection exists for beaver in townships numbered 1 to 52 until 1930; and north of township 52 the usual close

season, May 1 to November 1, is in force. Alberta gave protection to beaver from 1907 to 1912, but in 1909 protection of beaver was suspended within territories and under conditions determined by the government. In 1915 beaver were protected to 1920, and later to 1925. British Columbia has made little progress in the full protection of fur-bearing animals.

In most of the provinces definite attempts have been made to increase the supply of certain animals, especially beaver and otter, by full protection over a fixed period. This form of protection has been supplemented by legislation regarding the season in which animals may be caught, methods of capture, and other related devices. The aim of the protection has been primarily to increase the supply of furs, but also to prevent waste through trapping unprime furs.

An important step in the conservation of animal life has been the adoption on the part of all the provinces, at different periods, of regulations prohibiting the use of poison. The effect of poison¹ on the skins of the animals, but more particularly the far reaching destruction of animal life, because of its spread to animals other than those directly caught, has been responsible for the universal condemnation of its use.

Other regulations have been adopted by various provinces directed to the same ends. In Prince Edward Island the Fish and Game Protection Act of 1906 laid down close seasons for marten and otter from April 1 to November 1, with penalties for violation of \$1.00 to \$25.00. In 1897 New Brunswick fixed a close season for mink, fisher, and sable (marten) from May 1 to September 1, with a penalty of \$5.00 to \$20.00 fine, or five to twenty days in jail for violation. The close season for muskrat in the counties of King and Sunbury was fixed at June 10 to March 10 of the following year, with a penalty of \$5.00 for each violation. These

¹See a paper by R. T. Congdon of Dawson, given before the first annual meeting of the Commission of Conservation, 1910.

regulations have been improved, and the close season for mink, otter, fisher, and sable lengthened from March 31 to November 1; the close season for foxes is from March 1 to October 1, for muskrat from May 1 to March 25 in the counties of Westmoreland, Albert, St. Johns, Kings, Sunbury, York, and Charlotte, and from May 25 to March 25 in Kent, Northumberland, Gloucester, Restigouche, Madawaska, Victor, and Carleton. Shooting of muskrat is prohibited. In Nova Scotia (1896) close season was fixed for mink from March 1 to November 1. In 1909 regulations prohibited the destruction of, or the setting of traps near, muskrat houses. In 1913 it became illegal to take fur-bearing animals from their burrows or dens by smoking or digging them out.

In Quebec similar measures have been followed. Close seasons were fixed in zone 1 for mink, otter, marten, fox, and raccoon, from April 1 to November 1. Close seasons were also given for muskrat and bear. In 1906 in zone 1 muskrat was given a close season only in April. As early as 1868 Ontario introduced legislation with close seasons for beaver, muskrat, mink, sable, otter, and fisher from May 1 to November 1, with a fine of \$2.00 to \$25.00 for each skin. In 1897 muskrat were protected in April, and the destruction of muskrat houses forbidden. The extension of the Ontario boundary has been responsible for new provisions. In 1924 regulations were made prohibiting trapping of beaver and otter in the territory "lying south of the French River, Lake Nipissing, and the Mattawa River and in such territories south of a line due east and west thereof until January 1, 1926". A close season was fixed in all other parts of the province from March 31 to December 15. In Manitoba a similar problem has arisen. In 1915 longer open seasons were provided for the capture of marten, fox, lynx, and muskrat north of the 53rd parallel of latitude than south of that line.

The prairie provinces have not deviated materially from the general lines of legislation of the other provinces. Manitoba has a close season for muskrat, although this regulation

may be overridden by municipal by-laws in cases of destruction by those animals. In 1905 Saskatchewan fixed close seasons for mink, fisher, marten, otter, and muskrat. In 1907 Alberta fixed a close season for the same animals. In 1911 it became illegal to molest the houses of muskrats and the houses and dams of beavers in trapping. In 1915 foxes were placed on the close season list. Muskrat are at present fully protected south of the north Saskatchewan, and have a close season to the north. North of the 55th parallel the season has been thrown open for beaver from time to time as the situation demanded. In 1918 permits¹ expiring May 1 yearly were granted on payment of \$1.00 to trappers south of the fifty-fifth parallel. The furs were sold to the government, and 75 per cent. of the proceeds returned to the trapper.

Close seasons are fixed for bear, otter, and marten in British Columbia by order-in-council from year to year. This arrangement permits greater elasticity in regulations than is the rule in other provinces. It is illegal to destroy beaver or muskrat houses. Similar elasticity of regulations prevails in the northwest Territories through the supervision of the Territorial Council. In the Yukon Territory longer open seasons are given for beaver, otter, lynx, marten, mink, muskrat, and fox, north of the Arctic circle than to the south. In the Northwest Territories close seasons were fixed in 1885 for mink, fisher, marten, otter, beaver, and muskrat. In 1894 similar legislation was enacted and extended.²

The development of machinery for the enforcement of regulations has necessarily been slow and uncertain. An important part of the machinery has been the establishment of devices of control over trappers and traders to prevent illegal trapping and the trading of furs secured illegally. In Prince Edward Island residents are required to pay a licence fee of \$15.00 and non-residents of \$20.00. In New

¹Report of the National Commission of Conservation, 1918.

²See *Regulations for the Protection of Game in the Northwest Territories* for a full statement of present legislation.

Brunswick the regulations for 1897 prohibited the buying and selling of the pelts of protected animals during the close season, although these regulations were altered to allow game wardens to issue written permits for the sale of pelts within ten days after the close season began. The alteration allowed the trapper to carry on his work to the last day of the open season. Later regulations increased the effectiveness of these provisions in providing heavier penalties for the possession or sale of green pelts of protected animals during the close season. In 1909 licences were issued to trade and dress furs for \$25.00 to non-residents and \$2.00 to residents. Non-resident trappers were required to pay \$25.00 for a licence. Traders were required to keep records of the date of purchase and of the name and residence of the seller of each skin. Heavy penalties were imposed for each default. Under existing regulations *bona fide* residents pay \$10.00 to trap or trade in furs, and non-residents \$50.00. All raw furs are stamped by an officer of the Department of Lands and Mines. Royalties must be paid on furs before permission is given to export from the province. Nova Scotia in 1896 required non-residents to pay \$30.00 for a trapper's licence, although non-residents paying over \$20.00 taxes on property owned in the province were exempted. Penalties of \$50.00 to \$100.00 were attached to a violation of these arrangements. In 1902 the licence fee was raised to \$40.00; at present it is \$50.00. In 1907 the export of furs was prohibited. To prevent smuggling to other provinces, and the New England States, exports of furs by licence-holders were permitted in 1909, with a written permit from the warden. Accurate information is gained through rigid inspection by the warden. At present it is illegal to trade green pelts of beaver, fisher, or marten. The sale of other pelts cannot be carried on after three days from the expiration of the open period. Fur-buyers' licences are issued to non-residents for \$100.00 and to residents for \$25.00. Monthly reports are sent by holders of licences on the number and character of purchases and sales. Royalties are paid on skins exported, tanned and

dressed, or sold to non-residents—red fox 75c, otter \$1.00, cross fox \$1.50, silver fox \$2.00, mink 40c, raccoon 20c, skunk 15c, muskrat 5c, weasel 3c.

Quebec has developed similar regulations. Skins of protected animals may be sold during the first few days of the close season. Licences are issued to trappers. In 1906 each trader in furs was required to send a return of the number and species of furs taken, bought, and sold in the province. Fines for violation of this regulation were made increasingly severe, and in 1910 the penalty was \$100 for each offense. In 1906 royalties were charged on each skin similar to those charged in Nova Scotia. In 1916 fur traders' permits were issued on payment of \$10.00. At present non-resident traders' licence fees are \$100.00 and resident traders' \$25.00. Detailed rules and heavy penalties have been worked out to provide adequate control of the trade. Tanners and dressers are required to report whether skins received have been stamped by the government. Beginning in 1917, the government had successfully brought the fur-trade under control in its requirements as to the payment of royalties and the stamping of furs. During the first year of operation the government collected royalties on \$1,500,000—a partial indication of its effectiveness. Ontario adopted the licence system in 1908. Non-residents were required to pay \$10.00 to trap. The system was rapidly extended, and in 1914 every person engaged in the fur-trade was required to purchase a licence. Resident trappers' licence fees were \$5.00. In 1924 special licences were necessary to take beaver and otter. Tanners and dressers operate under a licence (\$10.00), and are required to make monthly returns on skins purchased. Royalties are charged—bear 60c, fisher \$1.50, cross fox \$1.50, red fox 75c, black fox \$10.00, white fox \$1.50, lynx 50c, marten \$1.00, mink 25, muskrat 5c, raccoon 10c, skunk 10c, ermine 5c, wolverine 40c, beaver \$1.00, otter \$2.00. Heavy fur-dealers' licence fees have taken on a protectionist character for Ontario industry. Resident British subjects pay \$25.00 "store licence", resident British subjects, with no

particular place of business, "travelling for buyers", \$100, and non-residents \$200.

As early as 1890 in Manitoba non-resident trappers' licence fees were \$25.00 and in 1896 \$50. In 1902 exportation of pelts was limited to licence-holders. In 1913 the licence system was extended, resident trappers paying 50c, non-resident trappers who were British subjects \$25.00, and foreigners \$100. Non-residents were permitted to trade with the Indians on payment of \$50. Reports were required as usual on the number of skins handled. At present trappers' licence fees are, for resident British subjects, \$2.00, for non-resident British subjects, \$50.00, for resident aliens, \$2.00, for non-resident aliens, \$200; traders' licence fees are, for the raw fur merchant, \$10.00, for the travelling agent, \$10.00, for the travelling fur buyer, \$25.00. Royalties are paid on skins, and fines of \$100.00 to \$500.00 are imposed for violation of this regulation. Saskatchewan also extended its licence system in 1913. Fur-dealers' licence fees were \$10.00, and resident trappers' \$25.00. Dealers were required to make detailed reports on furs traded. In 1916 legislation required shipments of furs to bear an official tag supplied with each licence, and railway companies were forbidden to accept shipments not properly marked. At present resident trappers' licence fees are \$2.00, non-resident fees \$25.00, fees for resident fur-dealers \$10.00, for non-resident \$50.00, for travelling dealers resident \$50.00, for non-resident \$100.00, for fur-dealers' agents, resident, first permit \$50.00, additional permits \$10.00 each, for non-resident \$100.00, for wholesale fur-dealers' licence \$100.00, for tanners and dressers \$10.00. Elaborate reports are required from trappers, traders, tanners, and dressers, on the skins handled. Royalties are charged at the rate of five per cent. on the average market value of each skin. Heavy penalties are attached to violation. Alberta in 1907 charged a licence fee for non-resident trappers of \$10.00, and for trappers' guides of \$5.00. At present resident trappers' licence fees are \$2.00, and non-resident \$25.00. Royalties vary at different periods. British

Columbia licence fees (resident) are \$10.00. Non-residents are not permitted to trap. Licenced trappers occupying a trap line prior to November 14 are protected against other trappers. Resident traders' licence fees are \$25.00, non-resident traders \$200.00. A limited system of royalty payments is provided. Furs may be exported only during the open season and two months thereafter. Provision is made for adequate reports on the number of furs caught and handled. Yukon territory non-resident trappers' fees are \$100.00. Residents do not require licences. Resident fur-buyers' fees are \$25.00, non-resident fees \$150.00. Furs are exported under permit on payment of an export tax. The Northwest Territories' regulations for 1893 required a licence fee of \$5.00 from non-residents. At present *bona fide* residents of the territory pay trappers' licence fees of \$2.00, non-resident British subjects \$75.00, and aliens \$150.00; *bona fide* resident traders pay a fee of \$5.00, non-resident British subjects \$150.00, aliens \$300.00. Residence refers to British subjects who have lived four years in the Northwest Territories.

The collection of fees has been necessary not only as a means of control, but to offset the increasing cost of effective regulation. Each province has developed its own administrative machinery. In Prince Edward Island enforcement of regulations is placed in the hands of regularly appointed game guardians, as well as constables, police, and even market clubs. A game inspector is appointed to supervise general enforcement, and has power to confiscate game, furs, and equipment on proof of illegality. New Brunswick in 1897 planned the appointment of a game warden for each county. Each game warden appointed deputy game wardens subject to the approval of the chief game commissioner. Each deputy was placed under a bond of \$100.00 or more to ensure a faithful performance of duty. Fishery commissioners and deputy Crown lands agents were appointed special game wardens, and a chief game commissioner was appointed to supervise and instruct the wardens in the

discharge of the regulations. All officers were given special powers in seizing green hides and pelts of animals taken illegally. Prosecutors were given one-half the fine except in the case of wardens or deputy wardens, who received all the fines. Rewards up to \$100.00 could be offered from time to time for apprehension of offenders. In 1898 market clerks were made game wardens *ex officio*, and powers were given to game wardens enabling them to search premises and buildings. In 1899 wardens were authorized to seize and confiscate to the Crown any green pelt found during the close season. In 1905 wardens and deputy wardens were required to pass an examination in wood-craft, natural history, and other subjects regarded as essential in efficiency. A chief ranger was also appointed to ensure better enforcement. In 1913 one chief ranger was appointed to supervise the work of all wardens. More recently protection of fur-bearing animals has been combined with forestry work under the direction of the provincial forester. The duties of forest ranger and game warden have been combined, and the number of *ex officio* game wardens greatly increased. The general tendency has favoured the appointment of specially qualified game wardens rather than the patronage system. Nova Scotia appointed a chief game commissioner in 1896 to supervise and instruct district commissioners. Arrangements were made with the Game and Inland Fishery Protection Society for the appointment of persons authorized to sell licences and to act as agents in enforcement. The Society was allotted 80 per cent. of the licence fees to enable it to carry on the work of regulation. In 1898 power was given to officers and agents of the Society, as well as to game commissioners and constables, to search for pelts illegally taken. In 1908 game inspectors were appointed, and registered guides and forest rangers given the powers of game wardens.

Quebec in 1899 appointed a game superintendent-general and game inspector-general to enforce regulations. These were given the powers of game wardens, and were *ex officio*

justices of the peace. Game-keepers were appointed, and all Crown land agents, timber agents, and wood-rangers, were *ex officio* game wardens. Since the creation of the Department of Game and Fisheries, Ontario has a deputy minister, superintendent, inspectors (not exceeding three), wardens, and overseers who have the authority of constables. During the earlier period, and under the Act of 1868, fines were shared equally between the informer and the municipality in which conviction of illegality was made. In 1877 all the fine was paid to the prosecutor. In 1897 a Board of Fish and Game Commissioners was appointed as a step towards more efficient regulation. In 1900 this Board appointed deputy wardens with the power of search warrant. Sheriffs, provincial police, wood rangers, Crown lands and timber agents, were appointed deputy wardens. In 1907 the Board was abolished and the Game and Fisheries Branch of the Mines Department established. This branch was placed under the direction of a superintendent and three inspectors to oversee the work of the game wardens.

In the prairie provinces game laws are administered under the Departments of Agriculture, and the regulations are enforced by provincial, local, and special game guardians. The Royal Canadian Mounted Police are *ex officio* game wardens. More recently each province has undertaken the task of organizing its own police. Manitoba in 1890 appointed game guardians, and empowered policemen, constables, and game guardians to search for furs procured illegally. Saskatchewan in 1905 provided for the appointment of a chief game guardian and district game guardians through the minister of Agriculture. The Royal North West Mounted Police were made *ex officio* game guardians. Guardians were given power to search during the close season and to confiscate furs taken illegally. Alberta adopted similar regulations in 1906. Proceeds of furs confiscated (up to \$25.00) were given to the game guardian. The chief game commissioner has become an important official in both provinces. British Columbia has a provincial game warden who appoints

special game wardens for limited periods. Regular wardens are occupied primarily in protecting game. In 1918 a provincial game conservation board was appointed to administer game regulations. The chief of provincial police was made chief game warden.

In the Northwest Territories legislation is administered by the minister of the Interior and the commissioner of Dominion Parks. The Yukon game ordinance is an exception, and is administered under the jurisdiction of the commissioner of the Yukon. Regulations are enforced by the Royal Canadian Mounted Police, who are *ex officio* game wardens. In the Yukon Territories other game wardens are also appointed. Since 1915 regulations in the Northwest Territories have been worked out by the Northwest Territories and Yukon Branch of the Department of the Interior. The Royal Canadian Mounted Police is the body of greatest importance in the enforcement of regulations.

It is impossible in a short sketch of this character to indicate fully the various changes in regulation which have taken place since Confederation. It has been possible only to outline the general trend of regulations.¹ Important indirect legislation in the interests of increased fur production has not been considered, although all game laws protecting wild life are in some sense related to the problem of fur production. Protection of forests against fires is important to the production of furs. In general these laws have followed the tendencies already described. Close seasons are most important methods of protection. The establishment of reserves and parks in which trapping and hunting are forbidden is a significant measure in the conservation of wild life. Quebec has followed a policy of leasing Crown lands as

¹For existing regulations it is necessary to keep in touch with the authorities concerned. A list of these authorities and their addresses in the various provinces and states may be found in R. G. Hodgson, *Raising Beaver for Profit* (Oshawa, 1924), pp. 22-6. A summary of the laws of states and provinces for 1919 may be found in A. Laut, *The Fur Trade of America* (New York, 1921), pp. 156-186. Unfortunately all summaries rapidly become out of date. *Petersen's Fur-Traders' Lexicon*, pp. 65-78, gives a similar digest.

reserves to individuals and fish and game clubs. The lessees are required to maintain guardians for the enforcement of regulations as an essential part of the agreement. Nearly five hundred leases involving an area of about ten thousand square miles have been issued in this manner. Various provinces have followed a policy of granting bounties on more destructive animals. New Brunswick in 1898 paid a bounty of \$5.00 for every wolf, and 50c for every wild cat or lynx. These bounties were increased in 1899. Other provinces have paid varying bounties on destructive animals at various times—the practice having developed at an early period.

The policy of the Dominion government as contrasted with the provinces has been shown in the Northwest Territories. Reserves and parks have been set apart in various parts of Canada which have served as breeding grounds for animal life. The Wild Life Advisory Board is a recent organization, including among its members representatives from various departments of the Dominion government interested in the protection of wild life. The organization has been instrumental in fostering legislation directed to that end. Large numbers of unofficial organizations, naturalists' clubs, fish and game associations, and the like, contribute in a very direct way to the enforcement of legislation.

The effectiveness of these regulations cannot be directly estimated. It is generally admitted and is regarded as inevitable that the existence of separate governments with different regulations and the proximity of a large consumer of furs to the south render enforcement difficult. Long boundary lines between the provinces and between Canada and the United States are factors militating against effective regulation. Trapping is carried on over wide areas, and the trapper has no communication with the outside world during a large part of the year. Large numbers of trappers are Indians and half-breeds, who are not thoroughly cognizant of regulations. Changes in regulations lead to confusion and are difficult to enforce. Indians are commonly under the

separate jurisdiction of the Indian Department of the Dominion government, and are brought under the regulations of separate government with considerable difficulty. An efficient personnel for the administration of unusually difficult regulations is the result of a long period of continuous teaching. The expense involved has in many cases made this state of efficiency impossible.

Certain provinces have found definite problems depending largely on peculiarities of geographic background, economic development, and the character of the population. The small area of Prince Edward Island and the scarcity of fur-bearing animals has been responsible for considerable laxity in administration. New Brunswick, during the earlier period, found difficulty in appointing efficient game wardens. The practice of granting fines to the officers discovering violations produced a state of mutual distrust rather than the co-operation essential to regulation. The minuteness of the regulations to which traders and trappers were expected to conform produced, in some instances, effects opposite to those intended. Illegal trapping and smuggling of furs were by no means completely checked. Nova Scotia, in spite of stringent regulations, has also found it impossible to check smuggling and illegal trapping. The payment of royalties of taxes on furs is usually shifted to the trapper, and operates as a direct incentive to smuggle furs to areas in which no royalties are charged as to the United States and Quebec. Nova Scotia has suffered also from frequent trifling changes of the seasons which led to confusion. Returns to the authorities are always subject to falsification. Similar tendencies have been noted in Ontario and Quebec. The latter province has found it difficult to control shipments of furs to such neighbouring territories as Ontario and New Brunswick and New York State. Furs are sent beyond the interprovincial boundary, and reshipped to large fur houses at Montreal and Quebec. In most cases it is impossible for the Quebec government to verify the point of origin of the furs. Lack of uniformity between the regulations and laws

of neighbouring provinces is a serious handicap to enforcement. In Ontario various complaints have been in evidence. High licence fees for foreigners have been regarded as a protective measure keeping out foreign competition, and enabling Ontario buyers to gain a monopoly of the trade. It has been claimed that regulations prohibiting the trapping of beaver until December 15 are impossible to enforce. Trappers¹ going into the bush in October and November cannot be controlled. Lack of uniformity with the laws of Quebec is a handicap to Ontario as well as Quebec.

The prairie provinces and British Columbia suffer even more seriously from lack of uniformity of laws. Furs may be sent by the rivers from one province to another without fear of detection. Large numbers of trappers are Indians and half-breeds. The staff of guardians is generally regarded as inadequate in numbers for enforcement. High licence fees have proved a stimulus to smuggling. Provinces with lower fees and royalties benefit through an increase in trade. The Northwest Territories have developed recent problems with the policy of restricting trapping and trading through high licence fees and the creation of reserves. Complaints are made by residents of the Northwest Territories that their children, by attending school in Alberta, have lost the rights of residents. It is claimed that the larger companies are given special privileges as against individual traders. Charge and counter charge are made to the effect that returns forwarded to the government are incomplete. Reserves are held responsible for increased competition among trappers and for greater destruction of fur-bearing animals. Large areas cannot possibly be adequately patrolled to prevent poaching. Trappers tend to concentrate near the reserves, and competition is increased. Trappers forced out of the Territories by high licence fees trap in Alberta, and deplete the fur resources of that province. Again lack of uniform regulations during a period of high prices, such as during the war, was held responsible for the development of a

¹*Mail and Empire*, Toronto, December 15, 1924.

lucrative smuggling business. Altogether conditions in the Northwest Territories cannot be regarded as satisfactory from the standpoint of regulation.

In spite of numerous difficulties in the enforcement of regulations, evidences of a drift toward improvement are in sight. Neighbouring provinces of Quebec co-operate in law enforcement by returning furs which are sent from Quebec without a stamp. The state of New York also co-operates in a similar way. In Alberta a rule was laid down in 1924 providing that close seasons could be imposed by order-in-council on agreement with the government of any province. Indications are becoming more evident that co-operation between various provinces in uniform regulations and in enforcement will become the rule. Conferences are becoming the rule between officials of various governments.

The situation in the United States may serve as an illustration of general tendencies. The Biological Survey of the United States is a federal organization with agents and wardens in every state to direct the enactment and enforcement of legislation. The game departments of each state co-operate with the Biological Survey, and legislation is enacted in the interests of the conservation of fur resources. A Committee on Interstate Commerce in Game enforces federal laws dealing with trade. Restrictive legislation has been carried much farther in the United States than in Canada, especially in the full protection of animals in various states, and the length of the close seasons. The Lacey Act provides for penalties of violations of the laws of individual states, as shown in shipments between states of furs procured illegally. The Biological Survey Board checks the shipments and receipts of furs to the important fur houses of the country, and provides for prosecution of illegal shipments. The tendency has been toward closer central control and more effective regulation.

Undoubtedly regulation is the crucial aspect of fur production. Fur prices have increased rapidly. In new northern countries such as Canada settlement has spread, trapping

methods have become more effective, and the necessity for improved means of regulation and enforcement has increased. The more valuable fur-bearing animals found in the north temperate climates have been found to an increasing extent in great danger. The problem of conserving and increasing the supply of these furs is the problem of regulation. There is no prospect of an increase of furs through the discovery of new areas, of new tribes of Indians, or of new species of fur-bearing animals. The consistent spread of settlement, and the opening up of new areas to agriculture, lumbering, and mining, constantly threaten existing supplies.

It would be utopian to attempt a sketch of the possibilities of regulation. Canada is in a singularly favourable position with vast areas open to the prosecution of the trade, with rising prices for fine furs of the north temperate areas, and with a constantly expanding market in close proximity. If a central authority with effective regulation machinery could be assumed, if adequate statistics could be gathered and investigations carried out as to the most effective way of increasing the number of fur-bearing animals, there can be no doubt but that the wealth of Canada in furs would be increased remarkably. The destruction of the organization which had been built up through centuries of experience in the fur-trade, in the abolition of the Hudson's Bay Company monopoly, has not been repaired. It was possible for a large organization to conserve its fur resources not only with reference to the fur-bearing animals, but also with reference to the highest possible returns. It has not been possible with the relatively slow growth of regulation in separate provinces, with regulations of one province offsetting and nullifying the regulations of other provinces, with protective seasons in one area increasing the price and the possibilities of destruction in other areas, to prevent the steady decline in many important fur-bearing animals. The prospects of decline in the not distant future of other animals are relatively bright.

It is a platitude to say that the fur resources of Canada are extremely valuable. They may be increased in quantity

and in value through the promotion of well-directed, uniform, and constructive efforts. Canada is destined to become in the modern industrial economy increasingly a specialized area in the production of fur, by virtue of its geographic and climatic background, provided always that requisite measures are taken to ensure growth in this direction.

§2. FUR-FARMING

The rise in the prices of furs, and especially of finer furs, which becomes conspicuous in the middle nineties and in the present century, has been responsible for the development of regulations designed to protect important fur-bearing animals. It has been no less responsible for the spectacular rise of artificial methods of production as shown in fur-farming.¹ Indeed, the distinction between fur-farming and regulation is in many cases not clear. In 1846 the Hudson's Bay Company was successful in establishing a colony² of beaver on Charlton Island. On the island of Anticosti, which is owned by M. Henri Menier, control is exercised over the number of animals taken from year to year. Companies interested in muskrats have leased large tracts of swamp and marsh land, adopted measures to prevent poaching, and taken a yearly harvest. The United States government, under a convention with Great Britain, Russia, and Japan, has assumed control of the fur seals on the Pribilof Islands. Blue fox ranches are established in connection with the seal rookery, and also on various uninhabited islands in the

¹Mr. R. W. Keast, in his study on "Fur-farming", has concentrated his attention on various details and practices involved in raising specific animals. These practices are unfortunately changing constantly with the experimental nature of the subject, and treatments of this character go out of date rapidly. Mr. Keast has attempted, however, to bring the discussion down to the present day. Multigraphed copies of his study may be had on application to the Extension Department, University of Toronto. See also J. A. Allen and W. C. S. McLure, *Theory and Practice of Fox Ranching* (Charlottetown, 1927).

²See an interesting proposal for the establishment of colonies of beaver in the Hudson Bay Territory, dated April 26, 1813, in Can. Arch., Selkirk papers, Vol. II, p. 605.

Behring Sea. In each of these cases it would be extremely difficult to state whether fur-farming or regulation was under discussion. For the purposes in hand a rigid definition is unnecessary. Regulation becomes effective in geographically restricted areas which are difficult of approach and easily guarded, as in the cases noted. Under these conditions production can be controlled to some extent through a supervised destruction of a limited number of animals and through supervised feeding. But fur-farming as ordinarily regarded involves more adequate control and a greater expenditure of capital.

Fur-farming has succeeded most conspicuously with animals which are extremely rare, and which have a high value because of the quality of the fur and the impossibility of imitation. Large numbers of animals during the past half-century have been regarded with increasing attention as fur-farming prospects because of increasing prices, difficulties of regulation, and increasing scarcity. The chinchilla is an example in South America; but of especial importance from the Canadian point of view has been the silver fox. It is proposed to review briefly the developments of the silver fox industry to illustrate the general problems involved.

The value of the silver fox cannot be ascribed to an increasing scarcity. The supply¹ of silver fox furs prior to the development of fur-farming varied closely with the supply of red fox. Its increasing value was the result primarily of the increase in demand. Significant experiments began in Prince Edward Island in the latter part of the eighties of last century in keeping the red fox in captivity. Later, on the basis of these experiments, attempts were made to raise silver foxes in captivity. Mr. Dalton (now Sir Charles Dalton) began to purchase live black foxes from trappers

¹Chief Trader Bernard R. Ross estimated that the proportion of silver and black foxes caught in the Mackenzie district during the period 1848-1860 was about two-fifteenths; red fox, six-fifteenths; and cross fox, seven-fifteenths. An estimate for White Whale River on the east coast of the Hudson Bay gives 1 cross fox for 10 red fox, 1 silver fox for 30 red fox, and 1 wolf for 100 red fox.

and others who had been unsuccessful in raising the young. Mr. Haywood had earlier attempted to raise silver foxes, but in all cases the mother had destroyed the pups. Further difficulties developed in getting the foxes to breed in captivity, apparently the result of sex inhibition. In 1883 Mr. Dalton purchased a pair of dark silver foxes which have been regarded as the foundation of the Prince Edward Island industry. Eventually Mr. Dalton and Mr. Oulton formed a partnership, and removed the foxes to Cherry Island, where they were kept in pens of wire netting. In 1894 Mr. Oulton, who directed the breeding end of the business, was successful in raising to maturity a litter of silver foxes. Others began to take a greater interest in Mr. Oulton's success, and the firm of "Tuplin and Gordon" purchased a pair of foxes from him in 1890. Captain James Gordon has been credited with the invention of satisfactory types of nests. Mr. Oulton's work became prominent in designing forms for pens. Mr. Silas Rayner contributed to the general development by success in breeding silver foxes from cross foxes and segregating the silver strain. With success along these lines, fox-farming¹ became of greater importance. In 1900 one of the silver fox pelts raised on the farms was sold for \$1,800 at the London fur sales. The result was a rapid increase in the demand for silver foxes for breeding purposes from 1900 to 1905. After 1905 larger numbers of pelts were sold on the market. The demand for foxes for breeding purposes increased, but a general agreement between important owners prevented the sale of live animals for breeding purposes to outsiders until 1910. In the autumn of that year the monopoly was broken and the sale of breeding stock began on a large scale. Prices increased rapidly from \$3,000 for breeding pairs in 1910 to \$20,000 in 1913. As a result large numbers

¹See J. W. Jones, *Fur Farming in Canada* (Ottawa, 1914), pp. 15-19, for interesting details on early development. The semi-centennial edition of the *Summerside Journal* contains many interesting facts not recorded by Mr. Jones. In some instances the two accounts differ materially. See *Canadian National Record for Foxes*, Vol. I (Ottawa, 1922), pp. xxv-xxxiii.

of corporations¹ were formed to finance the purchases, and a period of intense speculation followed. The first public corporation was formed in the United States in 1911. With the rapid decline in fur prices following the war and the disruption of the European market, large numbers of these newly-formed corporations disappeared. The development of the American market and the rise in prices of the post-war period have placed the industry on a sounder basis.

The industry developed concurrently in other provinces of Canada and in the United States. Contributions² have been made by many pioneers and various organizations, and publications have come into existence to foster the industry. In 1913 the Silver Fox Breeders' Association of Prince Edward Island was organized to conserve the interest of breeders and to protect purchasers against fraud by the establishment of a system of registration. In 1920 the Department of Agriculture of the Dominion granted a charter to the Canadian Silver Fox Breeders' Association³. Pedigrees of ranch-bred silver foxes are issued after inspection by an officer of the Live Stock department. Records are kept at the head office

¹For a list of fur-farming companies with their places of business and capitalization, and of fur-farmers in various provinces, existing in 1914, see J. W. Jones' *op. cit.*, App. XI, pp. 222-251. The annual fur-farm reports include the names of fur-farmers and their addresses arranged alphabetically by counties.

²Mr. Jones attributes the early difficulties of fox-farming to the following facts: (1) No good fencing material, such as woven wire, was available. (2) Warm, dry quarters for young litters were not provided, the necessity of having a small well-insulated nest which would be sufficiently warmed by the mother's body not being realized. (3) The monogamous nature of foxes was not recognized, and being quartered in one pen in large numbers the young were killed. (4) The price of fur was not high enough to induce breeders to risk large amounts of capital in experiment, and those who had the aptitude for the business usually possessed little capital. See J. W. Jones, *op. cit.*, p. 18.

³See *Canadian National Record for Foxes* (Ottawa, 1922) for a copy of the constitution and amendments; also for a list of pedigreed animals. The Association has not been regarded with favour by all fox-breeders. Farmers in the Yukon Territory and elsewhere have found it impossible to conform to the regulations. Men engaged in building up a ranch from wild stock are not in a position to subscribe to the rules of the Association without considerable financial loss. Recent legislation in Ontario is evidence of similar dissatisfaction.

of the Association in Summerside. Registered foxes are marked by tattoos of letters and numbers on the ears, and the purchaser is protected against fraud. Fox research stations have been established in Prince Edward Island and Quebec, and research work is being carried out on dietary and pathological problems. During the 1926 session of the legislature, the province of Ontario voted supplies for the establishment of an experimental farm for the raising of fur animals. Legislation has been enacted in all provinces¹ providing for reports from owners of live fur-bearing animals, and also for the regulation of shipments and other details, including permits for capture of live animals.

The present state of silver fox-farming in Canada is shown in the *Annual Report on Fur Farms* for 1924. The total number of fur farms in operation in Canada in 1924 was 1,551, of which 1,466 were fox farms, an increase in the latter of 287 over 1923. Of this total Prince Edward Island had 458, an increase of 10; Ontario had 291, an increase of 90; Quebec had 277, an increase of 29; Nova Scotia had 152, an increase of 29; and New Brunswick had 106, an increase of 17. With respect to total value of property, Prince Edward Island possessed 36 per cent., Ontario 16 per cent., Quebec 12 per cent., New Brunswick 9 per cent., and Nova Scotia 6 per cent. The difficulties involved in statistics regarding the value of property forbid an extended analysis. Prince Edward Island and Ontario are the more important provinces. A comparison between these provinces should give interesting results. The total number of silver foxes born in 1924 was 23,476, an increase of 4,176. The number of deaths of the young in 1924 was 2,905, an increase of 264,

¹A copy of "An Act to impose a tax upon foxes held in captivity in this province 3 Geo. V. c. 5, 1913, P.E.I.", may be found in J. W. Jones, *op. cit.*, App. VII. Excerpts from legislation in other provinces are also included, pp. 164-181. Present regulations may be obtained from the authorities of various provinces. The statistical information obtained from reports is included in the *Annual Report on the Fur Farms of Canada*, issued by the Dominion Bureau of Statistics.

of adults, 986, an increase of 107. The number of animals killed for pelts (young) was 3,180, a decrease of 1,408, adults, 3,324, a decrease of 401. In 1924 the number of deaths of the young was practically as great as the number of young killed for pelts. The number of deaths of adults was about one-third the number killed for pelts. The high death rate, especially of the young, is significant of the difficulties of the industry. In Prince Edward Island the percentage of deaths of the young to the number of animals born was 8.7 per cent., in New Brunswick, 10.2 per cent., in Quebec, 16.5 per cent., in Nova Scotia, 18.9 per cent., in Ontario, 25.1 per cent. The contrast between Ontario and Prince Edward Island is striking.

Undoubtedly the experience which fur-farmers of Prince Edward Island have had in raising foxes has been an important factor in determining the relatively low death rate. On the other hand, the tendencies shown in the fox farms of Prince Edward Island should have considerable significance. On the whole, the farms of this province were larger than the farms of Ontario. The average value of the land and buildings for 1924 on a fox farm in Prince Edward Island was \$1,728, and in Ontario, \$1,362. The average number of pens per farm in Prince Edward Island was 18, and in Ontario, 10.5. The number of foxes on each farm in Prince Edward Island is compared with the number in Ontario in the following table.

Percentage of farms having at the end of the year 1914		P E I.	Ontario
Less than 5 foxes	. .	18 3	30.2
5 to 9 foxes	. . . .	20 9	26 1
10 to 19 foxes	. .	20 7	22 6
20 to 29 foxes	. .	11 5	10 9
30 or over	. . .	28 3	9.9

The largest percentage (30.2) of farms in Ontario have less than 5 foxes, whereas the largest percentage of farms in

Prince Edward Island (28.3) have 30 foxes or over. In Ontario the general rule is small farms, whereas in Prince Edward Island the tendency is toward large farms. To an appreciable extent this situation is reflected in the forms of organization for ownership.

Percentage owning farms	P.E I.	Ontario
Individuals	69 4	75 2
Partnerships	14 8	19 9
Companies	15 7	4 7
Boarding foxes	44 5	26 1

The smaller farms of Ontario are financed by individuals and partnerships, whereas the larger farms of Prince Edward Island are financed by corporations. The larger percentage of corporations in Prince Edward Island is partly the result of the period of expansion from 1910 to 1914, in which Ontario shared to a less extent; but the amount of capital required to finance large farms is also important in determining the form of organization.

The evidence which has been considered supports the suggestion that experience and capital are important considerations. The low death rate of young foxes in Prince Edward Island would appear to be the result of these factors. The technique of fur-farming is undoubtedly of the greatest importance. The choice of location and the construction of the ranches require a high grade of experience. In 1923 it was estimated that \$20,000 to \$25,000 was required to purchase ten pairs of young foxes, build and equip a ranch, and operate it for one year. The choice and selection of stock is of the utmost importance. The problems connected with the breeding of foxes, feeding and raising of the young, sanitation and treatment of disease, demand long apprenticeship and experience on the part of the managers. The advantages of a large amount of capital are shown in the ability to hire competent managers, to purchase the best

stock, to equip thoroughly a ranch, to hire an attending veterinary surgeon, and to conduct an effective advertising campaign for the sale of the foxes. On the other hand, a large ranch has certain disadvantages, such as the possible destructiveness of contagious diseases and the fact that managers are not apt to have the same direct interest in the ranch as the individual owners. The industry has been dependent to a very large degree on the individual ranchers, who have grown up with the business and acquired a thorough grasp of its problems.

The importance of technique in the industry has given rise to new forms of organization which merit further attention. The practice has grown up of purchasing foxes from ranchers, of renting a pen from the rancher, and paying him an annual sum of \$100 to \$175 for care and feed until December, when the fur is prime and the pelts may be sold. The rapid growth of the practice appears to have been partly a result of the discrepancy between the prices of live animals and the prices of pelts. In 1924 Prince Edward Island sold 992 adult foxes for \$208,590, an average of \$209.80 and 4,614 young foxes for \$936,340, an average of \$202.90. In the same year 2,957 pelts of silver fox were sold for \$317,775, an average of \$107.40. Consequently fox ranchers have been interested in selling live animals rather than pelts. This tendency was especially evident in 1924.¹ As a result extensive advertising has been carried on encouraging purchases of live animals. Similarly an important Canadian export business has grown up for live animals, showing an increase from 1,187 black and silver foxes in 1923 to 5,802 in 1925.

¹*Report on the Fur Farms of Canada*, 1924, p. 7. On the other hand, larger fur-farms are beginning to advertise the silver fox from the pelt standpoint. Undoubtedly an effective co-operation between silver fox farmers will be necessary to secure tangible results. The great bulk of pelts in Prince Edward Island have been sold by consignment to auction sales. Fur companies bought a small proportion through agents or correspondence (*ibid.*, p. 23). In the Yukon Territory farmers find it advantageous to sell direct to the consumer and have a ready market in the tourist trade.

It is impossible to predict the future of the trade, but certain tendencies are in evidence. In spite of the heavy losses occasioned by the purchase of live animals by larger numbers of inexperienced farmers, which may be increased by advertising, and the loss through killing for pelts and consistent advertising, eventually the stock of live animals will increase and prices will decline. The work of scientific investigators, the contributions of numerous fur-farming magazines, and the wider experience of large numbers of farmers will to some extent check the losses through death of the young. Larger numbers of pelts will undoubtedly come on the market, and prices will decline. On the other hand, silver fox fur cannot be imitated, and so long as prices are high the demand should continue, especially if judicious advertising is brought into play. These are some of the factors which enter into the situation. The effects of changes in fashion and of improvement, or deterioration, of stock cannot be predicted. It would appear probable that Prince Edward Island,¹ by virtue of the stock which it has produced, the experience of its farmers, and the lead which it has in the industry, will be in a very favourable position as a producer of live animals. The problems of the industry could be met more effectively by an enlargement of the *Report on Fur Farms* to include statistics on information which cannot otherwise be made available. Although the Bureau of Statistics might find difficulty in obtaining funds to support extended work, it should be worthy of the government's support.

The problems of the fox-farming industry illustrate to an appreciable degree the problems of farming other animals.

¹The Silver Fox Exhibition at the Royal Agricultural Winter Fair in Toronto, inaugurated in 1922 under the auspices of the Canadian Silver Fox Breeders Association, awards the great majority of prizes to Prince Edward Island stock. An interesting paper on the advantages of Prince Edward Island, especially in the supply of fish for food will be found in F. A. Stelgenbauer, *Geographic Aspects of the Prince Edward Island Fur Industry*. (Economic Geography, Jan., 1927, pp. 110-125).

The experience gained in this connection has not yet been adequate to warrant an analysis. Various other furs are affected by changes in fashion in a more pronounced degree than silver fox, and the problem would be more complicated as a result. Undoubtedly the pioneers in the farming of other animals, in acquiring the technique of raising various species, and in developing the highest grades of furs, are making significant contributions for later progress.

The fur-farming industry of Canada is rooted deeply in recent economic developments. The rising price of furs has been responsible for the progress of fur-farming, as it has been responsible for the growth in regulations. But the development of fur-farming raises numerous problems of which the solution can be reached only by the persistent and steady work of pioneers. Each species has its own characteristics and its own problems which must be solved. It is hardly necessary to repeat that Canada, because of her climatic background, is in a strategic position for the development of fur-farming, and that the rise in fur prices has given it a secure place. The start which has been made in the farming of foxes has been a stimulus to experiment¹ in other species. But, as yet, the information is too inadequate to warrant predictions. We should expect greater success in fur-farming in those animals which are increasing in scarcity in wild life, which have pelts of high value through scarcity and quality, which increase slowly, which have ineffective regulations, which can be bred in captivity to produce the highest grade of pelts, and which are not affected materially through changes in fashion.

§3. THE PROBLEM OF SUPPLY

Important results of the rise in prices have been shown in attempts to increase the supply of furs through conserva-

¹Notices of these experiments may be found in large numbers of journals and recent publications. See J. W. Jones, *op. cit.*, pp. 20-112. Mink farming has received a great deal of attention as for instance in the Yukon Territory.

tion and through fur-farming. There remains the task of studying more adequately the problems of the supply of furs in general.

✓ Possibly no better instance exists of a fur which illustrates the long run cause of fluctuations in supply than the beaver (see Graph 17). The supply of beaver depended in the earlier history of the trade on the ability of the Indians as hunters, on the improvement of hunting methods following the importation of European devices, on the greater attention of the Indians to that occupation, on the number of Indians, and on ways and means of encouraging them to search over wider areas for new supplies. Fluctuations were unusually rapid as a result of wars among the Indians, competition with the Dutch and the English, and wars between France and other powers. Inability to control the supply, and the regulations designed to that end, had results difficult to determine. Finally, the supply of beaver showed the effects of competition, of monopoly control, and of the substitution of nutria and silk in the manufacture of beaver hats. The effect of regulations in conserving the supply of beaver are shown in the taking of from 165,000 to 230,000 beaver pelts in Canada in the years 1920-1924.

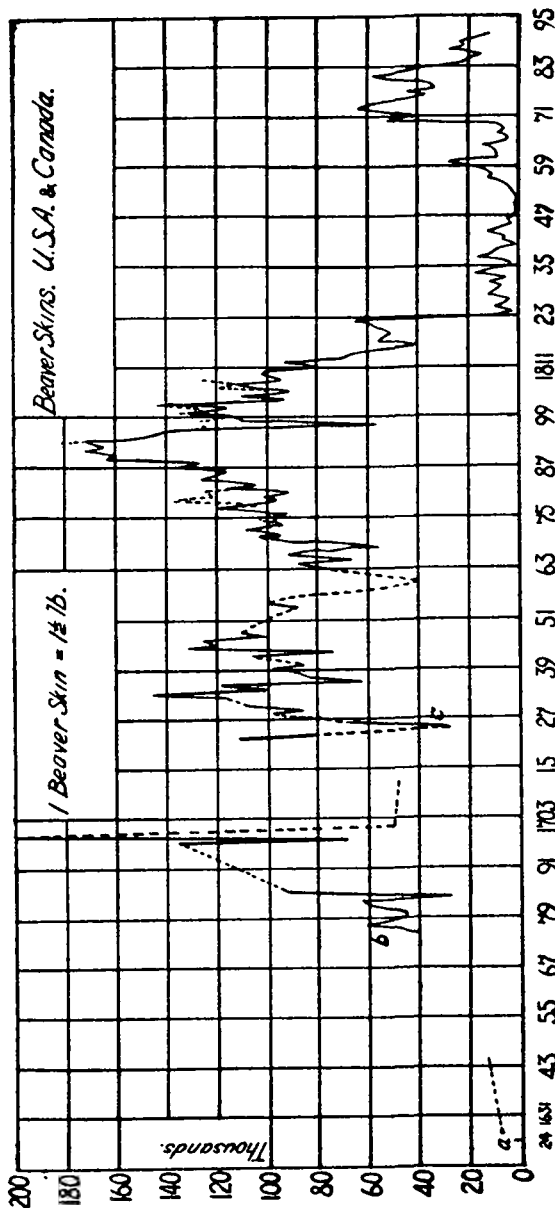
Undoubtedly a long run factor leading to a decline in the supply of fine furs is increase in settlement. With settlement the food of fur-bearing animals disappears in the destruction of forms of plant and animal life on which fur-bearing animals subsist. The disappearance of timber and shelter has a further devastating effect. Especially in the northern land areas of Asia and North America, the development of agriculture, mining, and lumbering has been an important factor in determining the supply of fine furs.

The importance of the change in producing areas of the world's furs may be gained from various estimates presented at different periods (see Table B). Fortunately, such estimates exist for a period similar to that discussed under prices—1863, 1907-9, 1913, and 1923-4. These estimates must necessarily be considered with the greatest caution,

Notes by H. A. Innis.

GRAPH 17

Graph by R. S. Cook

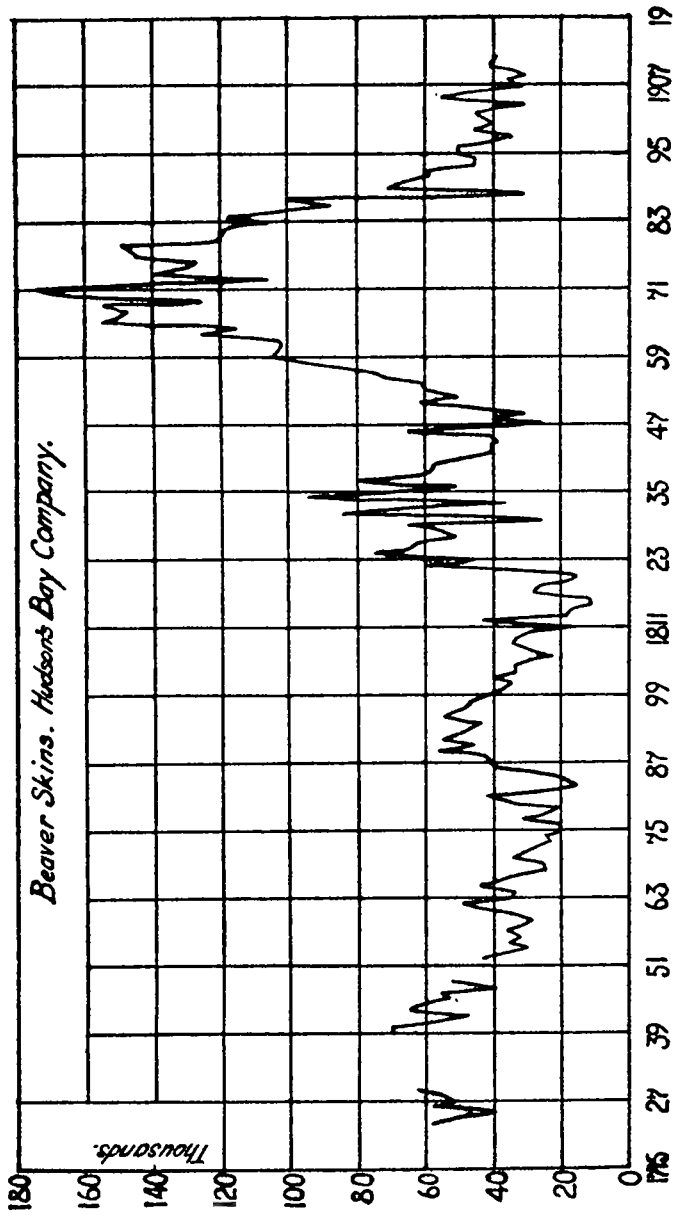


- (a) 1626 average 12-15000 lbs. largest number 22000 1645 est 20000 lbs. The habitants had for their share in 1645 98 casks of beaver at 200 lbs. each. In 1646 the share had increased to 160 casks.
- (b) 1675-1685. Amt. in hands of farmers. The high yield for 1685 does not represent the average supply.
- (c) 1722-1763. Isolated statistics are given as taken from various reports. See Appendix A.
- (d) 1763-1892. Poland These statistics are not satisfactory—the dotted line (1769-1806) indicates exports of beaver from Quebec and is given as a check on Poland's statistics in this period.
- (e) 1823-1869. The decline is a result of amalgamation and the sending of furs through York Factory by the Hudson's Bay Company.
- (f) 1869-1892. Increase in competition following railroad construction.

Notes by H. A. Innis.

GRAPH 17

Graph by R. S. Cook.



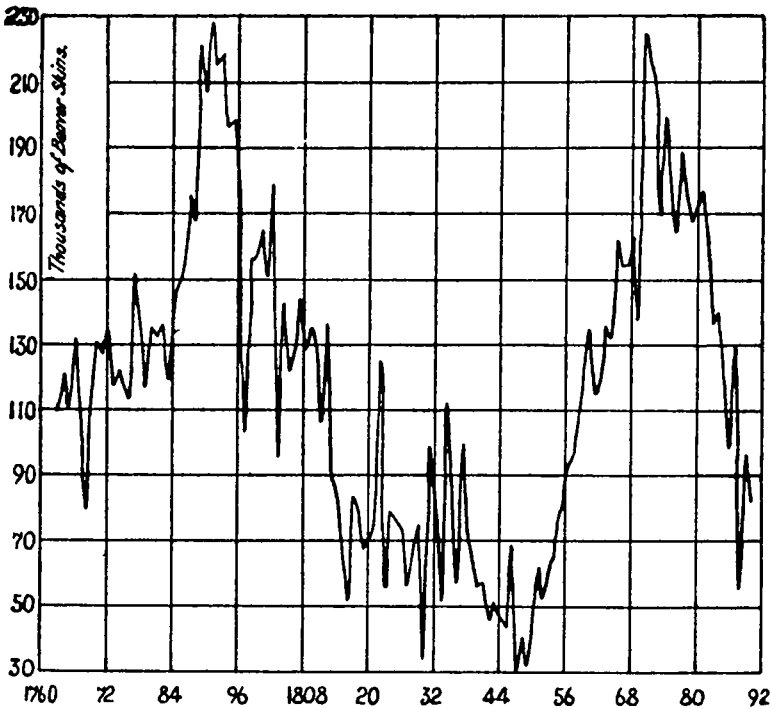
- (a) Report of Committee on Hudson's Bay Company, 1749, App X, pp 252-3
- (b) 1822-1869 During the first part of the period attempts were made by monopoly control to restrict production. After 1869 with competition, efforts to "nurse" the supply were futile.
- (c) The decline after 1880 was undoubtedly a result of the disappearance of the beaver and of prohibition regulations.

but they represent a rough approximation of the fur supply during the period. One of the most striking features shown in a comparison of furs throughout the period from 1863 to 1924 was an increase in the number of countries from which furs have been taken and an increase in the supply of furs from these areas. Necessarily, this increase involves the use of furs of a poorer quality from southern and more tropical land areas. The distribution of land areas over the earth's

Graph by R. S. Cook

GRAPH 17

Notes by H. A. Innis.



(1) These graphs are based on statistics following an addition of beaver skins sent through the Hudson's Bay Co. and through other companies as shown in Poland. The effects of competition and monopoly control are shown very clearly.

surface is significant to the development of the fur supply. The large land areas in the northern hemisphere, and the triangular shape of the continents in which the base of the triangle lies to the north and the apex to the south, limits the production of fine furs in colder seasonal localities to the northern areas of North America and Eurasia. Of the southern continents, Africa and South America, the base of the triangle and the great portion of the land areas are in tropical regions. The apex of the triangle and the smaller land areas extending to the southern temperate zones are devoted largely to agriculture, mining, and colonization activities. The southern hemisphere, with small land areas located in climates suitable to the production of fine furs, is necessarily limited in its possibilities of supply. Northern North America and northern Eurasia, through the size of the land areas and climatic characteristics, are logically the centres of production of fine furs.

The supply¹ of furs from southern areas has been partly dependent on colonization activities, but more largely on the increasing demand for furs. In South America furs produced in higher altitudes, in more southerly regions, and from "amphibious" animals, were most valuable and most rapidly exploited. Chinchilla was obtained in large quantities in 1863 (100,000). The numbers produced have fallen off materially and rapidly. After 1916 regulations and encouragement of the farming of chinchilla have to some extent affected the supply. A rapid rise in price and the declining supply of chinchilla led to an increase in the export of Bolivia, Plata, or bastard chinchilla, and the coarser furs of chinchillones (200,000 in 1923-4). Nutria (coypu) became important as a substitute for beaver in the manufacture of beaver hats. As in the case of chinchilla, production declined

¹Mr. R. H. Littlejohn, in an essay on the fur-trade of other countries, has collected considerable statistical material on the production of various furs in different countries. See H. Poland, *Fur-bearing Animals in Nature and Commerce* (London, 1892), which is an important source book of information on individual animals.

rapidly after 1863 (3,000,000). In 1923-4 the estimated production was given as 800,000. With the disappearance of more valuable furs, the cheaper furs have become more important. Skunks have increased from 5,000 in 1907-9 to 100,000 in 1923-4, opossum from 5,000 to 50,000. In the latter year 500,000 hares were produced. Lamb-skins increased from 500,000 in 1907-9 to 1,000,000 in 1923-4. Guanaco in 1923-4 was estimated at 30,000; vicuna in 1913 at 15,000; domestic cat in 1923-4 at 50,000; tigers and wild cats at 100,000. Small numbers of otter, fisher, seal skins, jaguar (Brazil, Pampas, and Patagonia) fox do not affect the conclusion that South America has become increasingly a source of supply of cheaper furs. With the more valuable furs decline has been characteristic and has been followed by rising prices, fur-farming, and regulation.

Australia and the islands of the South Seas are in a position similar to South America. More valuable furs have been rapidly depleted, restrictions have been necessary and the cheaper furs have greatly increased in importance. Kangaroo decreased from 50,000 in 1907-9 to 10,000 in 1923-4. Protection has been given in many districts of New South Wales and Victoria. The wombat has declined from 250,000 in 1907-9 to 2,000 in 1923-4, and protection regulations have been introduced. Opossum has decreased from 4,000,000 in 1907-9 to 1,500,000 in 1923-4, and protection has been granted in Tasmania, Victoria, and New South Wales. On the other hand, cheaper furs, as shown especially in rabbits, have increased remarkably. The estimated supply of rabbits increased from 20,000,000 in 1907-9 to 100,000,000 in 1923-4. Ringtails increased from 50,000 to 600,000 in the same period. Wallaby remained comparatively stationary, 800,000 in 1907-9, and 900,000 in 1923-4. Red fox increased from 60,000 to 400,000 in the same time. Domestic cats totalled 20,000 in the latter year. Smaller items, including badgers, nutria, and native cats, strengthen the general tendency toward an increasing supply of cheaper furs and increasing regulations to conserve the supply of more valuable furs.

Africa, like Australia, becomes important in the estimates of fur supply in 1907-9. Monkeys have increased from 10,000 in 1907-9 to 35,000 in 1923-4; jackals doubled from 10,000 to 20,000; leopards increased from 5,000 to 20,000. In 1923-4 Africa produced also 200,000 gazelles, 5,000 genet cats, 2,000 tiger cats, 2,000 civet cats, and 10,000 Persian lamb. The increasing demand for furs has affected the continent of Africa especially since 1900.

The northern hemisphere, with large land areas located in climates suitable to the production of finer furs, is the most important base of supply. Value estimates (see Table C) are extremely unreliable for furs, but it has been estimated that in 1863 in a total value of \$17,456,650 the southern hemisphere produced furs valued at \$1,245,000, or 7.1%. In 1907-9, from a total of \$70,400,000, the southern hemisphere produced \$6,600,000, or 9.3%. In 1923-4, from a total of \$212,600,000, the southern hemisphere produced \$14,400,000, or 6.7%. In the northern hemisphere, North America (excluding Greenland) occupies a prominent position. In 1863, from a total estimate of \$16,211,650, North America produced \$5,354,250, or 33.0%. In 1907-9, from a total of \$63,800,000 for the northern hemisphere, North America supplied \$20,000,000, or 31.3%, and in 1923-4, from a total of \$198,200,000, North America produced \$75,000,000, or 37.8%.

In the more valuable furs of North America, general tendencies, as shown in the Hudson's Bay Company's sales, have been already indicated. Silver fox have increased from 1,500 in 1863 to 4,000 in 1907-9, and with activities of fur-farming to 20,000 in 1923-4. Cross fox increased from 4,300 to 15,000 and 20,000 in the same years; red fox from 60,000 to 200,000 to 400,000; white fox from 8,000 to 30,000 to 120,000 (largely a result of the opening of new areas in the Arctic); grey fox from 25,000 to 50,000 to 80,000; blue fox from 6,000 in 1907-9 to 30,000 in 1923-4 (partly a result of fur-farming especially in Alaska); kit fox remained stationary. Aside from the fact that these estimates are

TABLE C: VALUE OF FURS

COUNTRY	1863 ¹	
	NUMBER OF FURS	VALUE
Siberia and Russian America.	10,027,300	\$4,652,500
Middle Europe	9,377,500	3,817,800
North America	5,169,600	5,354,250
European Russian, Sweden, Norway, Iceland, Greenland	3,775,600	2,387,100
South America, South Asia, Africa, Australia, South Sea Islands	3,700,500	1,245,000
	32,050,500	\$17,456,650
	1907-9 ²	1923-4 ³
	VALUE 5 marks = \$1.00	VALUE 5 gold marks = \$1.00
Asia	\$22,000,000	\$60,000,000
North America	20,000,000	75,000,000
South America	1,600,000	4,000,000
Australia	5,000,000	10,000,000
Europe and Russia	20,000,000	60,000,000
Oceania	1,800,000	2,400,000
Germany	2,000,000	
Austria-Hungary	1,000,000	
Africa		400,000
Greenland, Iceland, Spitzbergen, European Arctic		800,000

¹H. Lomer, *op. cit.*, pp. 47-51.²E. Brass, *op. cit.*, pp. 431-3.³*Ibid.*, pp. 434-6.

probably high, the increase in fox furs, especially of the finer and more valuable furs, has been the result of more effective trapping, marked increase through fur-farming, and the opening of new areas. Otter has increased from 20,000 in 1863 to 30,000 in 1923-4. Mink increased from 200,000 to 300,000, marten from 130,000 to 400,000. Fisher declined from 12,500 to 6,000. Beaver increased from 130,000 to 200,000 (partly a result of protective measures), lynx from 26,000 to 30,000, ermine (weasel) 400,000 in 1907-9 to 1,000,000 in 1923-4. Muskrat increased from 2,850,000 in 1863 to 8,000,000 in 1907-9, and to 20,000,000 in 1923-4; skunks from 100,000 to 1,500,000 to 3,500,000 during the same years; raccoons 600,000 in 1863 to 700,000 in 1923-4. Wolf increased from 12,500 in 1863 to 48,000 in 1907-9, and to 250,000 in 1923-4; bear from 15,000 in 1863 to 25,000 in 1923-4. Coarser and more southern furs increased rapidly—opossum from 250,000 in 1863 to 1,000,000 in 1907-9, and to 3,000,000 in 1923-4; marmot from 5,000 in 1863 to 25,000 in 1913; badger from 2,000 in 1863 to 20,000 in 1923-4; civet cat (lesser skunk) from 100,000 in 1907-9 to 600,000 in 1923-4. Domestic cat increased from 80,000 in 1907-9 to 150,000 in 1923-4. Furs of minor importance include the wolverine, which remained stationary at about 3,000. Moles appear in the 1923-4 estimates at 500,000; musk-oxen declined from 500 to 300; buffalo were estimated at 60,000 in 1863; fur seals have been protected, and the supply limited. These statistics tend to support the conclusion that prices in North America have increased. Large areas have been made accessible since 1863, population has increased, trapping has been carried on more effectively, regulations have been passed fostering an increase in fur-bearing animals, fur-farming has developed more valuable furs, and larger numbers of cheaper furs have been placed on the market. The existence of large areas in the northern regions, inaccessible and unsuited to agriculture, has been responsible for the fortunate position of the North American continent as a fur-producer in the period from 1863 to 1923-4.

Eurasia is the most important fur-producing continent. In the larger area, Asia and the great territories in northern Russia and Siberia, are found the more valuable fur-bearing animals. Russian sable has decreased very rapidly from 109,000 in 1863 to 95,000 in 1907-9 and to 6,000 in 1923-4. Protection has been found essential to prevent extermination. The sea otter has practically disappeared. The ermine (Russian weasel or stoat) increased from 350,000 in 1863 to 1,000,000 in 1923-4. Kolinsky increased from 80,000 to 300,000 in the same period. Otter increased from 4,000 in 1863 to 40,000 in 1913; squirrel from 6,000,000 to 20,000,000; red fox from 45,000 to 600,000; kit fox from 30,000 to 300,000. White fox declined from 54,000 to 40,000. Wolf increased from 6,000 to 100,000. Other valuable furs from Siberia and northern Russia include mink (20,000), pine marten (30,000), stone marten (30,000), fitch (150-200,000), Siberian polecat (600,000), silver fox (500), cross fox (5,000), blue fox (3,000), grey fox (150,000), lynx (15,000), wolverine (4,000), beaver (1,000), bear (10,000). The cheaper, coarser, and more southern furs have increased rapidly. Marmot increased from 40,000 in 1863 to 200,000 in 1923-4. White hare and white rabbit increased from 2,000,000 to 4,000,000; lambskin from 700,000 to 1,000,000; broadtail from 100,000 in 1913 to 200,000 in 1923-4; slink lamb from 100,000 in 1907-9 to 300,000 in 1923-4; kid from 800,000 in 1907-9 to 2,000,000 in 1923-4. Other cheaper and more southerly and easterly furs include pony (50,000), Chinese goat (500,000 to 3,000,000 from 1907-9 to 1923-4), Tibet lamb (500,000), susliki (500,000), pahmi or Chinese badger (60,000 to 300,000 from 1907-9 to 1923-4), Chinese and Japanese weasel (500,000), perwitzky (5,000), Chinese and Japanese sea-fox (260,000 to 400,000), jackal (10,000), Chinese dog (200,000 to 2,000,000), domestic cat (100,000), tiger cat (30,000), leopard (10,000), monkey (50,000), raccoon dog (300,000). As in North America, fine furs have shown a tendency to increase. The opening of new territory, as in

Siberia,¹ has undoubtedly been largely responsible. As in North America, new areas have been settled, protection has been essential for the more valuable fur-bearing animals, and cheaper furs and skins have increased in production to a marked extent. In Europe, pine marten increased from 120,000 in 1863 to 150,000 in 1923-4; stone marten from 250,000 to 400,000; fitch from 380,000 to 400,000; red fox from 140,000 to 800,000; otter from 12,000 to 40,000; moles from 1,000,000 in 1907-9 to 10,000,000 in 1923-4. Other valuable furs include mink (20,000), kolinsky (10,000), squirrel (500,000), muskrat (400,000), white fox (10,000), lynx (10,000), bear (2,000), wolf (5,000), wolverine (1,000), ermine (10,000). Cheaper furs increased rapidly. Hamster increased from 200,000 in 1863 to 2,500,000 in 1923-4; hare from 1,300,000 to 12,150,000; rabbit from 4,420,000 to 80,000,000; lambskin from 2,000,000 to 6,000,000. Other furs included domestic cat (400,000), wild sheep (200,000), badger (30,000), marmot (500,000). European fine furs increased more steadily than in Asia. In a country with relatively dense population animal life tends to reach an adjustment with environment, and rapid changes are not characteristic. On the other hand, the production of cheap furs increased rapidly, as in other countries.

The total world production of furs has changed materially from 1863 to 1924. For all producing areas certain distinct features are in evidence. For animals which have very valuable furs, which are easily caught, and which become, as a result, increasingly scarce and valuable because of their expensiveness, regulations restricting the numbers caught are essential. The sea otter, fur-seal, chinchilla, wombat, and beaver may be mentioned as illustrations. In the case of animals difficult to catch and unusually scarce and valuable, attempts have been made to increase the supply through artificial means, such as fur-farming. In all continents there

¹For an extended discussion of the importance of the fur-trade to Siberian economic development, see Jos. Klein, *Der Sibirische Pelzhandel und seine Bedeutung für die Eroberung Sibiriens* (Bonn, 1906).

exists abundant evidence of the increasing demand for furs in the dependence on cheaper furs and the increasing attention to the raising of animals producing substitutes for fur—Persian lambs, Chinese goats, Chinese dogs, ponies, rabbits, and hares. The demand for fine furs has continued to absorb larger numbers—a result of the opening of new areas, of increase in population, and of more effective trapping methods.

The analysis of fur production in the various continents is based on estimates which indicate clearly certain trends, but on which little reliance can be placed for an extended study. For this purpose it has been proposed that a study of fur production in Canada over an extended period might yield more satisfactory results. Unfortunately, however, difficulties are numerous. The great bulk of statistics on fur production have been obtained from the sales of the Hudson's Bay Company, and from exports. For the post-war period the Dominion Bureau of Statistics has issued separate reports on fur production, which should become of very great value. On the other hand, one cannot escape the conclusion that these statistics are not complete. The difficulty of collecting statistics on fur production renders this situation inevitable.

Nevertheless, by making allowance for various defects, it is possible that certain conclusions may be drawn. Statistics of Hudson's Bay Company's sales have the following difficulties. Sales in January and March are of furs caught the preceding winter. No allowance can be made for the holding over of furs from year to year to secure higher prices, although it is understood that the Company follows the policy of auctioning all its furs without reserve. In recent years (since 1920) the policy of selling furs in Montreal and other American points, and of entering the consignment business, will necessitate even more careful scrutiny of sales statistics. With increasing competition, Hudson's Bay Company sales represent less accurately the total production of Canada, although its sales are still basic desiderata. Prices and fashions tend to have an increasing effect on the numbers of

furs sold, and on the activities of trappers. Prior to the introduction of steamboats and railways, furs from more distant departments reached London one or more years later than those from departments directly accessible to London. Transportation facilities were occasionally inadequate, and a season's furs were delayed a year. With monopoly control prior to increased competition, the Company was in a position to direct production, as has been shown in the case of beaver and muskrat.

Nevertheless, graphs¹ illustrating sales statistics from 1821 have pronounced tendencies. It has already been pointed out that definite cycles are evident in most furs. The causes of these cyclical fluctuations are not definitely known. It is generally conceded that rabbits are an important factor² in determining the supply of furs from animals dependent on it for food. Seton in 1903-4 reported an abundance of rabbits in the Mackenzie River district. The Hudson's Bay Company's returns for lynx reached a peak in 1906. Lynx are caught, not when there is an abundance of rabbits, but after the rabbits have disappeared. The number of lynx sold is not necessarily an index of the number of lynx, but rather an index of the number of lynx and the ease with which they may be caught. Although lynx is a notoriously stupid animal, it is more easily caught after the food supply of rabbits has decreased. Mice³ have been shown to be scarcely less important in the Labrador. In 1903 it was reported that

¹Graphs of these statistics from 1821 to 1910 may be found in E. T. Seton, *The Arctic Prairies* (Toronto, 1911), pp. 103-106, and from 1821 to 1914 in G. C. Hewitt, *The Conservation of Wild Life in Canada* (New York, 1921), Ch. IX. Mr. D. M. Gowdy, in a study on fur production, has reproduced the latter graphs and extended them to include the data of the Dominion Bureau of Statistics. The latter has included in his study miscellaneous information on the important fur-bearers, and also on important factors of production, including Hudson's Bay Company personnel and organization, United States organizations, improved methods of trapping, prices, fashions, conservation measures, fur-farming, and Canadian exports.

²See E. T. Seton, *The Arctic Prairies*, Ch. XIV.

³See W. B. Cabot, *Labrador* (Boston, 1920), Ch. X.

mice were relatively scarce and foxes relatively abundant. In 1904 mice were more abundant, and fox returns relatively scarce. With an abundant supply of food foxes were difficult to trap. In 1905 mice were most abundant, and in 1906 they disappeared. The result was a marked increase in fox returns. Cabot has thrown out interesting suggestions as to various other results. Ptarmigan, caribou, fish, predatory animals, predatory birds, Indian life, and the fur returns of Labrador were affected by this fluctuation in food supply. With fox and other furs, even more than with lynx, fur returns represent not numbers of animals, but numbers of animals, scarcity of food, and ease with which they may be caught. Variations of fur returns have been shown in some cases to be the result of still other factors. Fluctuations in muskrat returns are alleged to result from climatic changes, especially rainfall. Seasons¹ of high water are favourable to the muskrat, and seasons of drought and low water unfavourable. Various diseases are also important in reducing numbers during a period of overcrowding.

The causes of cyclical fluctuations in animal life have occasioned considerable speculation. It has been suggested that temperature is a primary controlling factor, and "that fluctuations will increase in volume as the temperature of the isotherm decreases".² The admittedly greater fecundity of northern forms of life has been urged as partly responsible for this tendency. A further result of rapid increase in numbers is shown in over-population, overcrowding, the spread of epidemics, reduced fecundity, sex inhibition, loss of vitality, and weakness of the young. Interrelated factors include the activity and vitality of bacteria responsible for the spread of disease and the varying supplies of vegetation and food. The importance³ of climate and food supply has

¹See R. McFarlane, *Through the Mackenzie Basin* (London, 1908), p. 245.

²A. B. Howell, *Periodic fluctuations in the numbers of small mammals* (Journal of Mammalogy, vol. 4, no. 3, August, 1923, p. 150). Also E. T. Seton, *op. cit.*

³C. S. Elton, *Periodic fluctuations in the number of animals: their causes and effects* (British Journal of Experimental Biology, vol. 11, October, 1924).

been stressed in a recent study. It has been shown that lemmings have an average periodic fluctuation of $3\frac{1}{2}$ years, the maxima occurring "synchronously in North America and Europe, and probably all around the Arctic regions. The varying hare in Canada has a period of 10 and 11 years." An attempt has been made to link these varying periods of $3\frac{1}{2}$ and 10 to 11 years to the sunspot cycle,¹ and consequently to climate. On the other hand, the evidence is not conclusive. Other studies² have shown a shorter cycle—varying as follows: hare 8.5 years, lynx 9.5 years, red fox 9.6 years, cross fox 9.4 years, black fox 9.6 years, Arctic fox 4.2 years, marten 9.5 years, fisher 9.7 years, mink 9.7 years. No evidence of correlation of this cycle with lake levels³ appears to exist—not even in the case of the muskrat. The extreme difficulty of gathering adequate data makes impossible a conclusive study. If data were available for certain strategic posts over a long period of time, information might be gained on the emigration of animals as well as on production. It is difficult to state whether the increase in the fur-trade and the capture of large numbers of carnivorous animals has in any sense enhanced the maladjustment incidental to the lag between the rate of increase of rodents and carnivores. Statistics during a very early period of the trade should throw some light on the problem. It appears to be generally admitted that the rate of increase of rodents, especially in more northerly areas is more rapid than the increase of carnivores—the lag between the rates of increase disturbing

¹See the work of E. Huntington, especially *Climatic Changes: their Nature and Causes* (New Haven, 1922) and *Earth and Sun* (New Haven, 1923).

²C. G. Hewitt, *The Conservation of Wild Life in Canada* (New York, 1921), Ch. IX. Mr. George Walker, a trader at Little Salmon on the Yukon, informs the writer that rabbits, especially the young, on the upper Yukon were practically wiped out in the winter of 1924 and 1925 by a sudden and early drop in temperature to 40°. This disappearance was not in accord with the regular cycle. As usual, lynx and fox were scarce. Rabbits were numerous on the Lower Yukon in 1926.

³J. G. White, *Altitudes of Canada* (Commission of Conservation Report, Ottawa).

the balance at periodic intervals. Whether this lag is complicated with periodic climatic changes and changes in food supply still remains largely an unsettled problem, although opinion appears to favour the belief that temperature especially has appreciable significance. With present knowledge it is impossible to state, and under present competitive conditions utopian to ask, whether a restriction of the fur catch, especially of lynx, during a period of minima for rabbits, would have any effect in maintaining a better adjusted balance, and reducing the violence of fluctuation of all furs. It is quite possible that careful research and adequate conditions of control might increase materially the supply of Canadian furs. Under present competitive conditions, however, this can scarcely be expected. No single interest can afford to adopt measures of conservation so that other interests may gain.

It is a fundamental point that the supply of rodents, or the food of important fur-bearing animals, can be increased rapidly, and that the supply of these fur-bearing animals can likewise be increased.

The problem remains as to the trend of fur production in Canada. Comparison over long periods are unusually difficult. However, returns of the Hudson's Bay Company in 1865 for the districts of the northern department¹ are available, and these may be compared with similar areas reported in the statistics for 1923-4. For marten 1865 may be regarded as a trifle high for an average year, and 1923-4 as a very good average year, possibly a trifle low. In the Mackenzie River and Athabaska districts, 30,369 marten skins were sent out in 1865, and in the Northwest Territories and Alberta (roughly comparable areas), 13,350 in 1923-4. In English River, Cumberland, Saskatchewan, Severn River, Red River, and Norway House, 18,197 marten were exported in 1865, and in Manitoba and Saskatchewan, 6,386 in 1923-4. Possibly a better method of comparison, the northern department excluding Lac la Pluie (now in Ontario) produced in

¹See R. MacFarlane, *Through the Mackenzie Basin* (London, 1908), p. 272.

1865 a total of 45,817 marten. Manitoba, Saskatchewan, Alberta, and the Northwest Territories produced 19,734 in 1923. A similar comparison for fisher in the same areas shows a production of 1,074 for the northern department in 1865, and 845 in 1923-4 for the four governments. Moreover, 1865 was a low year for fisher and 1923-4 an average year. Manitoba is the most important area, and the omission of Lac la Pluie is responsible for a reduction of 322. For similar areas 5,687 otter were supplied in 1865, an average year, and 3,720 in 1923-4, a very good year. Minks suggest an important difference—21,915 in 1865, and 78,070 in 1923-4. Beaver shows a slight decline from 67,389 in 1865 to 62,555 in 1923-4. The effects of regulation renders analysis of slight value. Black bear remained stationary, 2,464 in 1865, and 2,465 in 1923-4. Lynx declined from 25,186 in 1865, a low year, to 15,227 in 1923-4, a very good year. Red fox increased from 8,697 to 29,487. Wolves declined from 7,696 in 1865, a high average, to 2,575 in 1923-4, a bad year. For the cheaper furs the trend is too conspicuous to warrant comparison. Skunks, muskrats, badgers, and ermines have shown a remarkable increase.

If we allow for probable inaccuracies in statistics, certain conclusions are suggested. Some important fur-bearing animals have declined appreciably in the past half-century. The causes of the general changes have been already suggested. A rising price for fine furs has led to increased trapping, to further decline, to a rise in price, and thus cumulatively to reduced numbers. Larger numbers of trappers, interested primarily in higher returns, have concentrated their attention on the most profitable furs. Increase in settlement, improved transportation facilities, more effective trapping methods, and the rise in price, have been responsible also for the tremendous increase in the supply of cheaper furs. Smaller animals, which are unusually fecund, which have a wide range of food, and which are difficult to capture, have not suffered materially through the increase in trapping, and the rise in price. But undoubtedly

the trend will proceed along the lines of increasing scarcity of finer furs, with the result that steps will be necessary to ensure a continued supply.

The development and improvement of steel traps has been an important factor. Large-scale standardized production has greatly increased the output; and the stronger, lighter steel traps have made it possible for the trapper to carry larger numbers to the interior. It has been estimated that eight to nine million traps are produced yearly by about fifteen manufacturers. With the improvement in traps has gone an increase in the number of white trappers. Indian trappers, although regarded as more skilled in trapping, are not as systematic in setting traps as the white man. The pecuniary return has a more powerful influence on the white trapper. The increase in the number of white trappers has been marked, and has accompanied improvements in methods of trapping. New transportation lines incidental to the construction of the railways have been important factors in encouraging the white trapper. Changes in business conditions have also had an important effect. A period of high prices, such as that which followed the Paris Exposition, or which occurred during the war, when rats were said to have brought as high as \$4.00 at Cumberland House, greatly increases competition. During a period of unemployment and depression, large numbers become trappers. If there is severe competition among traders the profit is larger from trapping than trading, and traders become trappers. The whole sweep of machine industry has been responsible for a reinforcing of the ranks of the trappers. The trapper is primarily an individualist who finds it difficult to work under an employer, or to adjust himself to the demands of modern industry.

The industry is carried on by an individual trapper, and usually not more than two trappers work together, each setting lines in a different direction. The trapper's capital and equipment¹ vary greatly with the individual and the

¹See Appendix B.

country. To get into the trapping grounds, the "outfit" can be floated down stream in roughly built and inexpensive scows with a home-made sail, or taken in boats, canoes, or "kickers". The scow may be broken up and the lumber employed for building. A base cabin is usually built on the bank of one of the main streams, preferably near a small tributary in which fresh water and fish may be found without difficulty. A clump of large spruce trees or other timber sufficiently large to furnish logs for the cabin is a further consideration. A log cabin of the required dimensions is built, the logs chinked with moss, and the roof made with a layer of poles covered with moss and dirt. A provision house or cache—a small log structure built a considerable distance from the ground and supported by four stout poles covered with tin to keep out mice and other marauders—and possibly a drying frame, if fish are abundant, or a kennel, if the trapper has dogs, complete the establishment. Small boards of various sizes for stretching the skins are easily supplied. The trap-line varies greatly. In many cases the trapper inspects the country, and in the early autumn places a line and builds small cabins at intervals of ten to fifteen miles over a line extending from twenty to sixty miles and beyond. These cabins are usually eight by ten feet, built of light logs at a height to clear the head from six inches to one foot. Logs are put down, and moss laid on each log to be packed by the next top log. The roof is covered with moss and dirt. A small cabin may be built in three to four days. Each cabin is supplied with one outfit of blankets (two double blankets), pots, and pans, to save packing.

Other trappers take less elaborate precautions. The trapper waits for the first snowfall, inspects the district to find where tracks are most abundant, and then builds small shelters. More energetic trappers build no shelters, carry a tent, or sleep out, and set out the traps, visit them weekly, or as often as convenient, and at the end of a month or so reset the traps on another line. The number of traps varies from 100 to 250, and are valued roughly at \$1.00 per trap.

Additional equipment for this work includes a camping outfit. Dogs are regarded with disfavour by many trappers. Dog feed must be supplied, and this is expensive in time or money. The trapper must provide for feed during the summer.

Returns vary appreciably. They depend on the trapper's experience, foresight, and energy, his knowledge of animal habits, of trapping methods, of the country, and of fur, his bargaining ability, the prices of fur, cycles of fur production, forest fires, and his luck. An average of \$200 to \$300 profit is given by many trappers. Others are said to have earned in some seasons from \$1,500 to \$2,000. An unusual catch at Fort Simpson of 129 marten in one season by one trapper gave an even larger profit. Many trappers undoubtedly lose heavily with changes in prices, and in animal migrations. New trappers and competition seriously reduce profits. Less respect is paid to the unwritten law regarding the sanctity of trap lines. Trap lines may be registered, as in British Columbia, but competition is serious in any case. A skilled trapper usually acquires the essential knowledge of the industry in two or three years. Each animal has its own peculiarities, and allowance must be made for numerous factors in each set—the depth of the snow, possibility of drift incidental to the character of the bush, of shelter, and of the season. Allowance must also be made for probable animal migrations and cyclical fluctuations. Old trappers are very cautious about information on deadfalls, snares, traps, baits, and the usual stock in trade of a trapper's knowledge. Each trapper to a large extent has his own formulae for getting fur. Disputes are numerous on the merits of sizes and manufacture of traps, on the season for skins, and other problems of trapping. Large numbers of magazines and articles are available offering advice as to various sets and devices, but these are regarded with an interest not always sympathetic. The returns may be sold to the nearest post or sent out to be sold at a per cent. com-

mission. The trapper¹ spends his money in the summer, and returns with an outfit in time to start the next season's work.

A variation of trapping has developed in some centres in the capture of animals, especially foxes and coyotes, in the summer, keeping them until the winter and killing them when the fur is prime.

The technique of the trapping industry favours an increase in the number of white trappers. Machine industry has made possible a marked increase in variety and quantity of supplies which can be taken to the trapping grounds. The capital required is not an important obstacle, since an increasing number of traders are willing to "stand" a trapper to supplies. The apprenticeship is not extensive, since a fairly large number of people have been accustomed to farming, to frontier life, and to trapping. The ranks of the trappers can be increased rapidly because of this large reserve.

The prospects are not promising. It appears probable that competition among traders will increase with the constant improvement of transportation facilities. The small experienced trader has certain advantages under conditions of favourable transportation over the large company. He is more actively interested in the trade. He is in a position to study a local situation more thoroughly, and to act with greater promptness. Small traders have not been slow in presenting their case to the government or in protesting

¹For information on trapping of various animals, see publications of the A. R. Harding Publishing Company, Columbus, Ohio, and current publications, such as *Family Herald and Weekly Star*, *Hunter, Trader and Trapper*, and *With Rod and Gun in Canada*. See also Agnes Laut, *The Fur Trade of America* (New York, 1921), and *The Story of the Trapper* (Toronto, 1902), and the works and articles of Arthur Heming, for miscellaneous information on methods of skinning various animals, treatment of skins, and other details. Very valuable information on the trapping of various animals is also available in B. R. Ross, *A Popular Treatise on the Fur-bearing Animals of the Mackenzie River District* (Canadian Naturalist and Geologist, 1861, and R. G. Hodgson, *Trapping in Northern Canada* (Oshawa, 1925).

against the larger company's activities in that direction. A small organization is commonly obliged to resort to greater activity in pushing the trade. Small companies have adopted a modification of the old North West Company's policy in leasing the posts to private individuals for a percentage of the profits with interesting results. The problem of all new competing companies with a large number of posts is primarily one of personnel. The Lamson-Hubbard Company undoubtedly failed to appreciate the necessity of securing a large number of reliable, experienced, energetic, and aggressive traders. The policy followed by their manager, Mr. Bryan, of giving post managers independent control had its disadvantages under these circumstances. The control exercised by Mr. Bassett, another officer of that company, had its disadvantages, which were equally in evidence. No form of control could be built up to supplant the inadequacies of the personnel. On the other hand, larger numbers of traders and trappers are gaining a more intimate acquaintance with the country and the trade. Governmental regulations alleged to have been passed through the influence of large companies to keep out the white trapper cannot be regarded as wholly successful. These regulations include setting aside of large Indian reserves on which the white trapper is forbidden, and the payment of large licence fees by the traders and trappers. Competition is increased in the restricted areas on which white trappers are allowed to trap. White trappers must go farther afield to find territory which has not been worked over. Moreover, the payment of a licence fee necessitates more vigorous trapping to enable the trapper to make a profit above his heavy expenses. Arguments against the white trapper to the effect that he traps persistently, and wipes out the fur, and that the regulations are designed to keep out the white trapper, to an appreciable extent lose their force. Licensed traders must in turn stimulate the trappers whom they have outfitted to greater activity in order to make a profit above their heavy expenses. The white trapper has penetrated far down the Mackenzie

River. There is evidence that the regulations cannot be enforced with the limited staff and the vast areas in which they are to apply. In view of these considerations, prospect of the disappearance of competition is slight, in spite of temporary checks which may be adopted restricting the white trapper and the white trader.

The problem is to some extent related to the policy of the Indian Department. The Indian Department of the Canadian government has adopted a consistent policy of giving a fixed annual payment, and in addition various goods, to the Indians. To a large extent this policy involves a continual subsidy to the fur-trade and to the missions, as is well shown in an interesting extract from the work of an old fur-trader. "Drever said to me, 'God, Mack! You have got them well trained. But how about the other bands?' I said, 'Every band will do just the same as you have seen done to-day.' And so they did. Each band came up as they were paid by the Agent, and did exactly the same. We had three days of it in the store night and day. The third day the Boss took off his coat and went at the trading with the rest of us. Five hours after the agent had finished paying, my cash balanced exactly with the amount the agent had paid out. We had made a clean sweep, and the treaty payments at Crooked Lakes were over for that year."¹ Goods were sold immediately after the treaty at high prices after allowance had been made for heavy overhead costs, and high charges of transportation. The effects are less marked under conditions of competition, but it is well known that many important fur-traders acquired sufficient capital through following up treaty-making parties to engage in the fur-trade on a larger scale.

Aside from the view held by missionaries, Indian agents, and some of the trading companies, that the white trader and trapper has an unfortunate influence on the Indian, the question of competition has other problems. Requisitions

¹N. M. W. J. Mackenzie, *The Men of the Hudson's Bay Company* (Fort William, 1921), p. 112.

are made out from year to year by the fur-trading companies on the basis of the last year's turnover. Goods are brought in to feed and clothe the white population and the Indians. Agriculture is necessarily limited, especially at the more northerly posts. Game, including moose, ducks, geese, rabbits, and fish, are in some instances protected, but such protection, because of the vastness of the area, the limited supervision, and the difficulty of framing adequate regulations, is not important. In many instances, as, for example, in regard to the regulations incidental to the Migratory Birds Convention Act, complaints are numerous and little sympathy can be expected. With the close of navigation the food supply is limited to these sources. Following conditions of severe competition and high prices, such as in 1921, the supply of food in the posts is exhausted rapidly. If rabbits are scarce at this time, and other developments reduce the available food supply, the Indians undoubtedly suffer. The reserve kept by the Indian agent may even prove inadequate. Competition does not permit a careful estimate of the exact needs of the situation in the requisitions of the companies. Moreover, unsuccessful competitors, faced with heavy overhead charges and material losses, have been known to turn to such profitable business as the sale of lemon extract and other deadly concoctions. The situation is complicated in that a scarcity of rabbits and food supply is, as a rule, followed by scarcity of fur and inability to purchase supplies. The enforcement of the game laws is closely related to the fur-trade. Competition renders impossible co-ordination between the post managers, such as is necessary to distribute supplies to consumers evenly throughout the year.

An important post which has heavy overhead charges and high costs of transportation, such as the posts on the Liard River, with approximately 200 people, may have one company import¹ 125 tons of freight, including 30 tons of flour, 2 tons of lard, 1½ tons bacon, 15 tons groceries, 1 ton rice, roughly 50 tons of food, the remainder being hardware

¹See Appendix C.

and dry goods. The total returns of fur floated down stream may exceed 2 tons. The whole balance of supplies can be planned with appreciable foresight under one company. With the addition of a competing company, which plans its requisitions on similar data, the result is one of unusual uncertainty. Competition is not in the best interests of the fur-trade or of the Indian. The fur-trade, as carried on over wide areas thinly populated, and requiring heavy capital investment in transportation and trading posts, can only be carried on in the long run under conditions, not of cut-throat competition, but of monopoly. Police protection is not adequate to offset the effects of competition as they have always appeared under those conditions in the fur-trade. There are indications that the trade in the more distant areas is about to enter on an era of competition similar to that which has characterized the trade in earlier periods. It is scarcely possible that the Indian Department or any authority will be able to prevent developments of sinister import to the Indians.

These considerations are aside from the problems raised by the transient trader interested in getting the largest possible returns in the shortest possible time, without regard to the long run results of that policy. It would not be difficult to collect a series of statements, beginning with the works of Champlain and ending at the present time, each with a burden to the effect that competition in the fur-trade is intolerable to the trader, to the Indian, and to the nation which hopes to conserve its fur resources. Increasing competition among traders favours increased trapping and more persistent destruction of animals. The constant improvement of transportation facilities renders competition inevitable, and greatly increases the strain on regulations designed to check the destruction of fur-bearing animals. It is questionable whether regulations can be elaborated to an adequate extent to check the forces which are let loose by new improvements in transportation and by the effects of modern machine industry.

IV. THE MANUFACTURE OF FURS¹

§1. TECHNIQUE

The marked increase in the demand and in the price of furs, and the consequent rapid increase in production, have had pronounced effects on the manufacturing industry. A tremendous increase in production has brought about marked improvements in manufacturing processes. The manufacture of furs has passed through an industrial revolution, and as in other commodities the pressure of demand has been a dominant factor.

The highly technical character of the industry favoured the organization of furrier's guilds which guarded the secret processes of manufacture and handed them on from generation to generation. During the early periods the guilds were strongly entrenched. As in the manufacture of other commodities, increasing pressure from the larger supplies of furs led to specialization within the guilds, and eventually, with the development of more efficient methods of treating furs on a large scale, the guild gradually declined. So general has become the diffusion of knowledge as to secret processes that schools have been organized with classes in furriery, and elaborate manuals² describing in detail the methods of manufacture have appeared on the market. The marked increase in manufacturing in the United States during the war following the disruption of European manufacturing

¹Mr. S. A. Snyder, in his thesis on the manufacture of furs and related industries, which is in the possession of the Extension Department, University of Toronto, has given a comparatively detailed account of the processes involved in the handling of the furs from the trapper to the consumer.

²C. J. Rosenberg, *Furs and Furriery* (London), and W. E. Austin, *Principles and Practice of Fur Dressing and Fur Dyeing* (New York, 1922), are examples. The following pages will describe the industry as it has been outlined in these works.

greatly furthered the tendency toward wide dissemination of knowledge.

The development of manufacturing on a large scale assumes the existence of large quantities of uniform, standardized raw material which can be treated in a uniform, standardized manner and turned out as a uniform, standardized product. Furs of a uniform character are notoriously difficult to obtain in large number. For the same species of animal the furs will vary in size and condition with the age and condition of each animal, with the season in which they have been caught, with the district, with the methods of capture, with the methods in which they have been taken from the animal, and with the methods of treatment prior to shipment.

The method of taking the pelt from the animal by the trapper is closely dependent on the demands of later processes. With several animals "the skin is cut from the tail down the centre of the belly to the jaw after which it is carefully removed from the body and spread out flat. It is then nailed on boards, fur side inwards." These are referred to as "open" skins. "The skins which are usually 'opened' are seals, chinchilla, beaver, nutria, moles, bears, marmots, Persian, and all Chinese skins." "Cased" skins are those which are cut down the hind legs on either side of the tail and then pulled off over the animal's front feet and head, leaving the fur inside. These skins are stretched on boards of various sizes with the fur inwards and then dried. Occasionally, as in the case of a particularly fine marten skin, the fur will be left outside to show the depth of the dark colour. Obviously the less promising pelts are handled in the usual way.

The skins brought in by the trapper include a great variety of each species and a number of species. According to the demands of the later manufacturing processes, they are sorted and graded on the basis of size, condition, season, and colour¹. It is a common statement that no two men, no

¹Actual quotations for January, 1917, paid by merchants in the trade at

matter how experienced, will grade the same furs in the same way. After the preliminary grading, the furs are shipped to large centres in which the demand for fur products is concentrated, and to which the purchasers of large quantities of fur for manufacture may come without inconvenience. The necessity of purchasing large numbers of furs of a uniform

Muskrat	Large		Small	Kitts
	Spring,	Winter, and Fall	Fall	
N.Y., P.A., N.J., N. Eng., E. Canada	48	38	20	.05
Mich., So. Wis., Ohio, Ind., Ill., W. Va.	48	38	20	.05
Central & S. Ohio, Ind., Ill., W. Va., Ky	42	32	18	.05
Central & S. Pa., N.J., Del. & Md	42	32	18	.05
Va., Carolinas, Tennessee	40	30	15	.04
Mo., Ark., Mans., Pac. Coast	38	28	15	.04
Wis., Minn., Iowa, Neb	40	30	15	.04
Black	55	45	20	.08

large and showing the variation in prices of raw furs at the time, according to geographical differences in source of origin.

See A. Belden, *op. cit.*, p 483.

Mink	Large	Medium	Small	No. 2	No. 3	No. 4
	No. 1	No. 1	No. 1			
East. Canada, New Eng., N. Y	5 00	3 50	2 50	2 50	.75	.25
N.Y., N. Pa., and N. N. J.	4 50	3 25	2 25	2 25	.60	.25
Minn., N. Wis., and N. Mich.	4 50	3 25	2 25	2 25	.60	.25
Wis., N. Iowa, and Dakotas	3 50	2 50	1 75	1 75	.60	.20
Mich., N. Ohio, N. Ind., N. Ill.	3 25	2 25	1 50	1 50	.60	.20
S. Pa., S. N. J., Del., Md., & W. Va	3 25	2 25	1 50	1 50	.60	.20
Va., and N. Car	3 00	2 00	1 50	1 50	.40	.20
B. C., and Alaska Coast	3 00	2 00	1 50	1 50	.40	.20
S. Ohio, S. Ind., Ill., and Ky. . . .	2 75	1 75	1 35	1 35	.40	.20
S. Iowa, Neb., Kans., & N. Mo.	2 75	1 75	1 35	1 35	.40	.20
Pac. Coast, & Rocky Mt. States	2 75	1 75	1 35	1 35	.40	.20
S. Car., Tenn., Miss., Ala. & Ga	2 50	1 65	1 25	1 25	.40	.20
S. Mo., Ark., Okla., Tex., La., Florida	2 25	1 60	1 10	1 10	.35	.15

character for manufacturing purposes is the occasion for a further grading of furs carried out with the greatest possible accuracy. The difficulty of examining large numbers of furs and the necessity of examining samples of the grade of fur which is purchased have been responsible for the emphasis placed on the auction system. Sales of large quantities of furs must be conducted with the utmost confidence in the grading of the furs by the sellers. A system of grading has been devised showing the character of the furs and the district from which they have come, and ensuring an accurate description.

After the furs have been accurately graded and large numbers of the same grade packed together, they are sent to the manufacturer to be dressed. A brief description of the processes involved in dressing is essential to an understanding of the organization of the industry. For purposes of dressing, winter skins are divided into two classes, close-grained and open-grained. The close-grained skins include sable, ermine, marmot, and skunk, and the open-grained skins, fox, wolf, and bear. The furs are scraped and cleaned of superfluous flesh and fat. The first process of "liquoring" is applied to all skins. Fat and fleshy skins are placed in tanks of salt water for about twenty-four hours to soften and free the skin of grease. Various modifications of this process are used for different skins, including the addition of certain chemicals to the water, the length of time involved, the use of wet sawdust rather than water, and the working of the skins with a beaming knife. The result is the softening of the hard, dry pelts which have been shipped by the trapper. After this process the skins are thoroughly rinsed, and are placed in a hydro machine, which consists of a large iron cylindrical bath containing a perforated basin which revolves at a high rate of speed. The skins are placed with the fur outside, and the rapid turning of the machine removes the water. The process again varies with the species of fur. The skins are taken from the hydro to a large drum about ten feet in diameter. The drum contains oak, beech, birch,

or any hard, light-coloured sawdust, and is rotated slowly from one to two hours. By this means oil and dirt are removed from the hair. The sawdust is in turn removed by "caging". The skins are placed in a protected wire cage with one-inch mesh. This mesh allows the sawdust to leave the cage when in motion. A quarter of an hour to an hour is required to free the skins from dust. The next process is that of "fleshing". All fleshy and fatty materials are removed from the skin to expose the corium, and provide for the effective and uniform action of the tanning chemicals. Each skin is again immersed in salt water for an extended time to make it more pliable. The "flesher" removes superfluous flesh by passing the skin across a knife. The process requires considerable skill, because of the thin character of the skin and its liability to damage from cuts. Fleshing machines have been devised for certain skins in which a rapidly revolving blade removes the flesh from the skin, but, on the whole, the process is carried out by manual work. Various furs require special treatment in the use of chemicals and other devices to remove the flesh and the operation is an extremely delicate one. The high value of furs necessitates the greatest caution. The skins are then taken to a drying room. The drying is carried out gradually, and usually with steam heat, until the skins are perfectly dried.

After these preliminary operations the skin is practically ready for the final process of tanning. For this process the skins are again softened by an application of salt water as a preparatory measure. As in the leather industry, the process of tanning is extremely varied and complicated. The character of the tanning materials depends in part on the character of the pelt, on the time, labour, and cost of materials, and on the character of the dyes and chemicals which are to be used after tanning. The salt-acid tan, or pickle tan, is extensively used because of its cheapness and ease of application. A typical formula includes a 10% salt solution with half an ounce of sulphuric acid to each gallon. The liquor is applied evenly on the skins with a brush, and then

they are placed in a pile for a period of time varying from a few hours to two or three days. The tanned skin is of a milky-white colour. A large number of variations in the character of the formula, in the acids and materials, in the methods of treatment, in the temperature and conditions under which tanning takes place, and in the length of time required, are characteristic of the tanning material. Mineral tans include chiefly alum and chrome. The alum tan gives a leather greater stretch and flexibility than with pickle tan. It is used especially for rabbits and moles and for better grades of tan for such furs as martens, muskrat, and squirrels. Alum or aluminium sulphate and salt are the usual constituents in proportions of two of alum to one of salt, or in other varying proportions. The formulae are innumerable. Chrome tan has very limited uses because of the great care and accuracy necessary in the treatment, and because the leather has a pale blue-green tint. On the other hand, the leather is very durable and very resistant to water. Chrome, alum, and salt are the principal constituents. In chamois dressing, various animal fats are used. Oils which absorb oxygen from the air, such as seal oil, whale oil, cod liver oil, and which are referred to as "drying oils", are of greatest importance. The oil is rubbed on the flesh side of the skins. "They are then folded up and put into a 'kicker' where they are tramped for two or three hours to work in the oil." The kicker is a receptacle, capable of holding from 1,000 to 1,500 muskrat skins, in which two wooden hammers turn and pound the skins. The pelts are hung up in a warm room to permit the oil to oxidize, another coat of oil is applied, and the same process repeated. After the tanning process is complete, the excess oil is removed, and the skins are washed and dried. Fine furs, such as marten and mink, are placed in ball drums in which balls of varying sizes and weights, depending on the character of the skin, work in the oil while the drum is being rotated. Various formulae containing formaldehyde are used for tanning purposes. The resulting leather combines the properties of alum tan and chamois tan.

This process is claimed to give immunity from the attacks of vermin and moths. Various other tans, and combinations of tans, are used for the manufacture of special leather. The relatively slow progress of chemistry in explaining the process of tanning is responsible for the tenacious hold of innumerable open and secret formulae.

With the completion of tanning, the skins¹ are dried. Great care must be taken to ensure steady and rapid drying from the standpoint of economy of time and the effects on the leather. Considerable progress has been made in the evolution of efficient drying machinery. The conveyor dryer is a steel enclosure holding air, heated by steam coils to a uniform temperature, through which the skins pass on horizontal conveyors. Drying requires from one to eight hours, depending on the character of the pelt. After the drying treatment, oil is usually placed on the leather, and the skins are put in a tramping machine. The addition of oil improves the softness and flexibility of the pelt and increases its resistance to water. The next step is the "staking" process, in which the skins are drawn and worked over the edge of a dull blade. The leather becomes soft and flexible, and the skins are stretched to give the greatest possible surface to the furs. Stretching machines are being introduced for the cased skins with which one man may handle up to 6,000 skins per day. The fur is then combed to straighten out the hair, and beaten to give it beauty and lustre. Machinery has been installed in some plants to carry out this work. The skins are again put through the drum process with sawdust to be thoroughly cleaned and polished. After the drum process, "caging" is repeated to remove the sawdust. Finally, some of the fine furs are put through a process in which the longer top hairs are cut out leaving the soft under-fur. The work is done to an increasing extent

¹Skins which improve on being worked in the length, such as skunk, mink, and kolinsky, are roped in the wet state after tanning. They are drawn across a rope which binds the hairs more closely together, makes the skin longer and narrower, and gives the fur a better appearance.

by unhairing machinery. Cheaper furs are unhaired by cutting the fur and the hair to the same level. Other methods include a variation of the very old device of warming the skins to a high temperature, placing them on an "unhairing block", and drawing out the top hairs by the roots. With these final changes the fur is prepared for the dyeing process.

The effect of the pressure of supply on the dressing industry has been shown in the increasing use of machinery adapted to handling larger quantities of skins. The changes in the dyeing industry have been no less pronounced. Not only have larger quantities of furs necessitated the development of improved methods of dyeing, but the increasing supply of cheaper furs has stimulated a demand for methods of improving the appearance of these furs as imitations of the more expensive varieties. In fact, improved methods of dyeing have greatly widened the market for cheaper furs.

The processes involved in dyeing are as complicated as those in dressing. The first process in the preparation of the hair or fur dyeing is known as "killing". No conclusive explanation has been given of the character of this process. It is held by some authorities¹ that the surface of the natural hair is covered to a varying extent "with a fine coat of fatty material which renders the hair more or less impervious to dye solutions." The application of dye to natural furs produces varying results depending on the part of the hair to which it is applied, the top-hair or under-hair, the character of the hair, depending on the animal and on the part of the animal from which it is taken, and on various other factors. The process of "killing" is that of removing the external covering by the use of various chemical alkalis, such as ammonia, soda ash, caustic soda, and caustic lime. The characteristics of various furs determine the chemicals used and the method of treatment. The problem involved in the treatment of all furs arises from the different reactions of the leather and of the hair to chemical solutions. The leather must be oiled, preferably with "an inert mineral

¹See W. E. Austin, *op. cit.*, chap. X, *passim*.

oil", to prevent reactions from alkalis used to "kill" the hair. This problem relates primarily to the dip process in which the furs are immersed in the chemical solutions. The brush process in which the solution is applied to the hair with a brush avoids the difficulty, but at the same time is much more expensive. Commonly a combination of the two processes may be used for an adequate treatment of the top-hair and the under-hair. After treatment by the dip process "the skins are drained and rinsed in fresh water, and then entered into a weak solution of an acid in order to neutralize any remaining alkali." Finally the skins are washed in fresh water, placed in the hydro to remove all trace of water, and prepared for the next process.

The application of dyes¹ at this stage produces varying results. Uniformity may be obtained, but in many instances the dye is taken up very loosely and washes off very easily. To fix the dye in the fur with greater permanency, and also to secure certain results from dye colours, the furs are treated with mordants. The mordants are certain chemicals which appear to combine with the hair and also with the dye. The chemicals, which are usually compounds of aluminium, iron, chromium, copper, and tin, are of such a character that they easily dissociate in water, forming oxides and hydroxides which unite with the hair. The character of the process is by no means thoroughly understood, and a great variety of methods of treatment are involved. After the skins have been immersed in the mordant solution for from six to twenty-four hours, they are removed, drained, and rinsed in water to remove the excess of mordant liquor. In this moist condition they are taken to the dye baths.

The final step in the process of dyeing is carried out with two methods, as in "killing" the furs. The brush process is used to colour the tips and upper part of the hair, and the dip process to colour the entire fur and the leather. The importance of the dip process increased with the discovery of chemicals which could be used effectively as dyes without

¹See *ibid.*, chap. XI.

injuring the leather. The increasing demand for more efficient methods of handling large quantities of furs in a uniform method led to the adoption of the dip process on a wider scale. The invention of brush-dyeing machines has been the result of similar factors. The dip process involves the placing of the furs in a dye bath until the proper shade is obtained, the removal of the furs, washing off excess dye, and drying and finishing with the usual machines for drying, cleaning, and "caging". Commonly a combination of the dip and brush process is used to obtain special results. The soft, flexible skins are then sent to the furrier.

The dyes vary greatly in character, in methods of treatment, and results. For mineral colours compounds of lead and manganese, and occasionally iron, copper, cobalt, nickel, and combinations of these compounds, are used. These colours are applied with brushes. Chemical solutions which break upon contact with the hair and form an insoluble compound, or which produce an insoluble compound on the hair when brought into contact with another chemical solution, are employed. Vegetable dyes were formerly of greater importance and involve the use of various secret formulae. These formulae include as important constituents tannin materials, such as nutgalls of various species, sumach and chestnut extract, wood dyes as logwood, Cuba wood, Brazil wood, quercitron, cutch, and tumeric. These are applied with both the dip and brush methods. Aniline black has been developed with the coal tar dye industry. This dye has been employed since 1862. Important advances have been made especially since 1900 with the experimental work of Green and others. The development of the coal tar industry and the production of synthetic dyes has been of fundamental importance to the fur-trade. Since 1888 numerous fur dyes have been developed. With the tremendous improvements of the dye industry cheaper furs have been produced in imitation of more expensive furs, the cost of production has been reduced, the market for furs widely

extended, and the possibilities of changes in colour through changes in fashion rapidly increased.

With the completion of dressing and dyeing, the furs have reached the stage in which they are prepared for the consumer. Most fur-bearing animals are small in size,¹ and

¹An approximation as given in connection with the London fur sales for the year ending March 21, 1906.

Kind of Fur	Size in Inches
Badger.. . . .	24×12
Bear	72×36
Beaver	36×24
Cat, civet	9× 4½
Cat, wild	30×15
Ermine	12× 2½
Fisher.	30×12
Fox, blue	20× 7
Fox, cross	24× 8
Fox, gray	27×10
Fox, red	24× 8
Fox, silver	24× 8
Fox, white	20× 7
Lynx	45×20
Marten, Baum	16× 5
Marten, Stone	15× 5
Mink, American	16× 5
Muskrat, brown	12× 8
Otter, sea	50×25
Raccoon	20×12
Sable, American	17× 5
Sable, Russian.	15× 5
Seal, fur	40×20
Skunk	15× 8
Squirrel	10× 5
Wolf	50×25
Wolverine	16×18

WEIGHTS OF DRESSED FURS PER SQUARE FEET

Name of Fur	Weight in Ounces
Ermine.....	1½
Otter (unplucked).....	4

varying number of skins of varying weights are needed in the production of the finished product.¹ The choosing of skins² for the manufacture of a garment involves unusual

Otter (plucked)	3 15/16
Beaver (sheared)	4
" (plucked)	3 15/16
Raccoon	4½
Skunk	2½
Mink	3½
Marten (Baum) natural	2½
" Stone	2½
Muskrat (natural)	3½
" (plucked)	3½
Lynx, natural	2½
" dyed	2½
Fox (Northern), natural	3
" dyed	3
Seal	3
Sable	2½
Silver Fox	3

¹For a careful study of the problems of each species of fur, see C. J. Rosenberg, *op. cit.*, pp. 65 ff.

²Some of the important uses of different furs are shown in the following table:

Name of Fur	Various Uses
Muskrat (natural)	Ladies' coats, linings, caps, muffs, scarfs, motor robes, mitts
Muskrat (dyed)	Coats, muffs, scarfs.
Beaver	Ladies' and Gents' coats, scarfs, muffs, and caps.
Beaver (sheared and dyed)	Coats, scarfs, muffs, caps.
Mink	Wraps, coats, scarfs, muffs, neckpieces.
Marten	Chokers, scarfs, muffs, wraps.
Marten (stone)	Chokers, muffs, scarfs.
Weasel	Scarfs, muffs, hats, wraps.
Skunk	Coat trimming, muffs, scarfs, coats.
Fox	Scarfs, muffs, neckpieces, trimmings.
Fox (dyed)	Scarfs, muffs, neckpieces, trimmings.
Mole	Wraps, cloaks, scarfs, muffs.
Wolf	Scarfs, muffs, trimming.
Wolf (dyed)	Scarfs, muffs, trimming.
Lynx	Scarfs, muffs, trimming.
Cat	Scarfs, muffs, trimming.

skill and care. Sorting is one of the most skilled occupations in the trade. The surface and the underground of the skins must be carefully studied in order that the furs will match when sewn together. The matching is done with regard to quality, colour, size, and economy. After the selection of furs the cutter begins his work. The cutter is a highly skilled workman who fits together the numerous skins with the greatest possible economy and the best possible results. He must be able to judge where the cuts should be made from the standpoint of the character of the seams used, economy of material, and, above all, appearance. Scarcely less important in the production of high-class furs than the cutter is the nailer. The skins are dampened on the leather side and stretched with great care to produce the best results in appearance, and economy in the use of the furs. For all furs the greatest variety is possible in the use of the skins and the appearance of the finished product is essentially dependent on the skilled workmen. Machinery is of relatively minor importance in the manufacture of fur goods.

After the cutter and nailer have completed their work the furs are sewn, lined, and finished. Sewing machines have come into prominence with new inventions since about 1880. Further inventions and improvements in 1901 and 1911 permitting the use of high-speed machines driven by motors have greatly widened the market. But some exclusive firms engaged in the manufacture of high-class furs still adhere to hand-sewing for the best results. Following a careful inspection, the finished product¹ is sent to the show room to

¹Various related products of the fur industry have not been discussed in detail. Large quantities of waste material consisting of small fragments which cannot be worked into the fur garments are consumed in various ways. Bear-skin is in great demand for the manufacture of paint brushes; beaver and muskrat are used in the manufacture of hats; badger, long-haired pieces, for paint brushes; fox, for trimmings for foot-stools, foot-bags, gloves, and the tails for the manufacture of boas; hare, the ears are used in the manufacture of hunting caps and muffs; skunk is used for linings, the heads for decorating hunting muffs, the tails for paint brushes; rabbits, the large heads are made into cuffs, the small heads into trimmings, the tails into paint brushes; marten, the foreheads for mosaic

be sold to the consumer. The later stages are carried out most successfully with skilled labour.¹

coverings of foot-stools, the tails for trimming fancy goods, making paint brushes, the claws for linings; mink, the tails for trimming and dress borders; otter are used for hats; raccoon for sleeves and linings; seal for caps. Modern methods of manufacturing felt hats follow closely the methods developed in the manufacture of beaver hats. The blowing machine was an important device, by which a strong current of air did the work of separating the coarse from the fine fur. The finest grades were blown farthest by the draughts, and the coarse grades dropped nearest the fans. The grade of fur required for the inside of the hat is taken to the forming machine. The necessary amount is placed on a feeding apron, and run through rollers revolving at about four thousand revolutions per minute. The fibres are separated in this way and thrown opposite a slowly revolving copper cone. This cone is about three feet high and finely perforated. An exhaust draft within the cone draws the fibres to the outer surface, and holds them in place until the whole has a delicate covering of fur. A fine spray of boiling water causes the fur to set or felt. The thin form is removed and other layers added, shaped, and moulded. This process requires highly skilled labour. Dressing, finishing, polishing, trimming, and binding complete the process.

The development of the manufacture of felt hats or fedoras is shown in the following table:

FUR FELT HAT INDUSTRY (UNITED STATES CENSUS)					
	1899	1904	1909	1914	1919
No. of establishments . . .	171	216	273	224	176
Persons engaged . . .	19,814	23,666	27,091	22,932	21,318
Capital invested . . .	17,000,000	23,000,000	36,000,000	40,000,000	58,127,770
Salaries & Wages . . .	10,000,000	13,000,000	16,000,000	14,000,000	24,000,000
Value of Products . . .	28,000,000	37,000,000	48,000,000	37,000,000	83,000,000

The growing importance of machinery and large-scale production is shown in the slight increase in the number of establishments and in the number of people employed and the marked increase in capital invested and the value of the products. The industry has gained appreciably through improved methods of dyeing, which permit the extension and development of fashions.

Brush-making is of relatively slight importance. Badger hair is used in the manufacture of shaving brushes, and sable hair has distinct characteristics for the manufacture of brushes for art painting. The process is largely carried out by hand. The hairs are taken from the skin and sorted according to colour and length. The knot of hair is dipped into resinous cement and fixed to the handles. The fur-trade is important for the manufacture of soft brushes only.

¹A list of wages paid to various operatives gives some indication of their relative importance. The standard is a forty-eight hour week. Learners (male

The importance of skilled workmen in the manufacture of fur goods has a direct relation to methods of retailing furs. Manufacturing firms become retailers. The expensive character of fine furs necessitates the development of a custom trade, in which garments are individually fitted. Large numbers of small retailers are engaged in the trade to meet the individual demands of consumers.

The possibilities of imitating fine furs has also led to the appearance of large numbers of small retailers, who are in a position to sell imitation furs at a profitable rate. The names of the most valuable furs have been given to the furs which are produced on the largest scale. As a result legislation has been enacted, and various organizations¹ have attempted to prohibit the practice of misnaming furs. On the other hand, the larger houses have gained through the general uncertainty, since the consumer is obliged to rely to an increasing extent on an old and established reputation.

Other important factors affecting retail organization are changes in fashion, the development of the fur renovation business, the increasing demand for furs, the seasonal character of the sales, and the demand for more effective means

and female, fifteen years of age) start at 15/- per week, rising to 55/- in the seventh year of employment. After seven years, or after reaching the age of twenty-four, the worker ceases to be a learner. Apprentices commence at 12/-, rising to 42/-. Cutters, with four years' experience, are paid 80/-, with less than four years' experience 65/-; nailers, 60/-; dressers, 70/-; sorters, 80/-; and the piece rates are from 1/8 to 2/2½ per hour. Female learners (machinists) are paid 15/- to 35/- in the fourth year. Female machinists, 45/-; liners and finishers, 40/-. See J. C. Sachs, *op. cit.*, p. 124.

¹See F. G. Ashbrook, *Trade names in the fur industry*, Journal of Mammalogy, vol. 4, November, 1923, pp. 216-220. In England the Fur and Skin Trades Section of the London Chamber of Commerce (Incorporated) has carried on a campaign against misdescription of furs under the Merchandise Marks Act, 1887. The London Fur Trade Association issues at present a list of incorrect and approved descriptions of furs that has been agreed upon by the British Fur Trade Alliance and the Drapers Chamber of Commerce of the United Kingdom. Legislation has been enacted in various states and in the provinces of the Dominion requiring that an accurate description of the fur should accompany the imitation name. It has been estimated that ninety per cent. of the furs sold in the United States are given imitation names. See Appendix D.

of preserving furs. The improvement of the dyeing industry has made possible rapid changes in the appearance of furs necessitated by changes in fashion. Fashion changes in other clothing and garments have immediate effects on fur garments. The institution of annual fur fashion shows has stimulated the trade in fur garments materially. Consequently it has become increasingly essential that precautions should be taken by the retailer and manufacturer to guard against loss through changes in fashion. The loss is partly offset through the ability of fashionable centres to dispose of unsold stock in more remote districts in which the fashions have lagged appreciably. On the other hand, the tendency for this lag to disappear with improved methods of communication and the rapid changes in fashions has greatly increased the demand for fur and occasioned a substantial rise in price. In the changes the large retailer with a reputation to maintain finds it necessary to dispose of his stock through annual late winter and early spring sales to individual purchasers or to small retailers.

The increasing price of furs and the scarcity has been responsible for the development of renovation work which can be carried on with the equipment of a small retailer. Large numbers of garments worn for a certain period of time are changed according to changes in style or for the purpose of eliminating unsuitable pieces. The growing importance of cheaper and less durable¹ furs has furthered the renovation industry.

¹W. E. Austin, *op. cit.*, pp. 5-6.

Name of Fur	Durability: Otter = 100
Astrachan	10
Bear, brown or black	94
Beaver, natural	90
Beaver, plucked	85
Chinchilla	12
Civet cat	40
Coney	20
Ermine	25
Fox, natural	40

The manufacture and retailing of furs is a business of a pronounced seasonal¹ character. The consequent heavy overhead has brought several problems. For the large retail

Fox, dyed black	25
Genet	35
Goat	15
Hare	05
Krimmer	60
Kolinsky	25
Leopard	75
Lynx	25
Marten, Baum, natural	65
Marten, Baum, blended	45
Marten, Stone, natural	45
Marten, Stone, dyed	35
Mink, natural	70
Mink, dyed	35
Mink, Jap	20
Mole	07
Muskrat	45
Nutria, plucked	25
Opossum, natural	37
Opossum, dyed	20
Opossum, Australian	40
Otter, land	100
Otter, sea	100
Persian lamb	65
Pony, Russian	35
Rabbit	05
Raccoon, natural	65
Raccoon, dyed	50
Sable	60
Sable, blended	45
Seal, fur	80
Seal, fur dyed	70
Skunk, tipped	50
Squirrel, grey	20-25
Wolf, natural	50
Wolverine	100

¹The number of male wage-earners in the Canadian fur goods industry in 1922 was lowest in March (898), and highest in October (1,106). January to April were slack months, and large numbers were hired in each month to October.

stores, price policies must be arranged to obtain the largest possible returns during the fall season when the furs are in demand to offset a loss which occurs in the sales of the furs during the latter part of the winter season. Manufacturing also dovetails closely with the retail business. Raw furs come on the market from January to March, and after dressing and dyeing are made up into the finished products for the August and September sales. Large retail houses have also adopted the policy of constructing cold storage plants¹ and soliciting the deposit of furs on the part of customers for the summer months.

The marked increase in demand for furs has had still other results. Departmental stores have engaged to an increasing extent in the sale of products made from staple furs. An increase in consumption has led to the production of furs on a large scale and to the development of a standardized marketing organization. The revolution which has taken place in marketing machinery following the development of communication and transportation facilities has affected furs as well as other commodities.

The number of female wage-earners was lowest in April (1,121), and highest in November (1,551). The slack season continued until July, and the number of employed increased rapidly to November. The plants were in operation on an average of 279.9 days in the year, and were idle an average of 24.1 days.

The "moth" is one of the worst enemies of fur goods. The eggs of the insect are laid at the roots of the hair. The larvae, on hatching, attack these roots with disastrous results. A temperature of 45° F. is sufficient to prevent damage. Cold storage plants usually maintain a temperature of 20° to 26°. Two types of mechanical refrigeration are in use: (1) Direct, in which coils are arranged for the circulation of brine or other cooling mixtures within the storage room; (2) indirect, in which the air-cooling room is separated from the storage room, and the two are connected by a system of ducts through which the cold air is circulated by a fan. The latter is more expensive, but avoids damages from moisture or leakage of the pipes. The storage room is carefully insulated with cork, felt, cement, firebrick, and other materials. An air space is also a common device. A large modern plant involves an expenditure of \$200,000. For protection against theft, fire, and insects a charge of 3 per cent. of the value of the garments is made by the retailers. The discovery of new methods of controlling destruction by insects may seriously affect the cold storage industry.

The retailing of furs appears to fall into at least three distinct classifications: (1) The exclusive stores located at the fashion centres and engaged in retailing primarily the high-class, expensive fur products. (2) The standard marketing machinery devised for the handling of large quantities of cheaper furs. (3) The small specialized retailer who engages in a custom trade, purchasing his furs directly from the dresser and dyer or from the wholesaler who manufactures fur goods on a large scale.

§2. INDUSTRIAL ORGANIZATION

The organization of the manufacture and sale of fur goods has changed materially during the past three-quarters of a century, but especially since 1900, and in a revolutionary fashion since 1914. The early importance of the skilled workman gave countries which had been long established in the industry a pronounced advantage in the dressing, dyeing, and manufacture of fur goods. Moreover, it is maintained that these advantages were additional to climatic considerations and the character of the water¹ available. Germany had distinct advantages in dressing and dyeing in the possession of a large number of skilled workmen. With increase in the number of furs manufactured, large numbers were sent to Germany, and the advantages of large-scale production in lower costs became important. Moreover, the development of the coal tar dye industry in Germany greatly strengthened her position. Other countries of Europe were also engaged in the dressing and dyeing industry, and prior to the war specialization was pronounced. Germany specialized in smaller skins, especially squirrel, but also Persian lamb and fox. England excelled in larger varieties, and London was famed as a centre for dyeing seal. France

¹The importance of water in dyeing and dressing has been greatly over-emphasized, according to Austin. See W. E. Austin, *Principles and Practice of Fur Dressing and Fur Dyeing* (New York, 1922), ch. VII. On the other hand, see C. J. Rosenberg, *Furs and Furriery* (London), ch. VII.

concentrated on muskrat and black rabbits, and Belgium on "fancy" dyes.

The war had serious effects on the organization of the fur-trade through the disappearance of Leipzig as an important dressing and dyeing centre. The result has been a marked development in England and in North America. This change is strikingly shown in statistics of the dressing industry in the United States¹ for 1914 and 1919. Several tendencies are in evidence. The increase in the size of the plants is conspicuous. The average capital employed in each plant was more than doubled. The number of plants increased from 96 to 141, and the total capitalization from approximately \$2,500,000 to \$9,000,000. The number of plants owned by corporations more than trebled, whereas the number of plants owned by individuals declined. The number of employees in plants owned by corporations and owned by individuals increased, but the increase was more pronounced in plants owned by corporations. Wages increased more than six times, as was to be expected from the importance of skilled labour. The value of the product increased over seven times. The statistics warrant the conclusion that machinery has become increasingly important, demanding larger quantities of capital. On the other hand, it is evident that skilled labour still occupies a very important place in the industry.

In Canada similar tendencies have been in evidence, although the statistics are not sufficiently adequate to warrant a detailed analysis. The number of establishments from 1910 to 1924 increased from 6 to 8—and the amount of

¹FUR DRESSING IN THE UNITED STATES.

Year	No of est	Ownership			Total Capitalization	App. Av Capital	Wages	Value of Product	Av No. employees Plants of Individuals	Av No employees Plants of Corporations
		Indiv idual	corpor- ation	Other						
1914	96	53	19	24	\$2,489,868	\$26,000	\$908,030	\$2,875,036	8	36
1919	141	49	62	30	\$8,867,403	\$630,000	\$6,338,835	\$20,384,569	14	63

capital increased from \$198,500 to \$926,270. Five plants were situated in Quebec, two in Ontario, and one in Manitoba. In 1924 the dressed fur industry employed 429 male wage-earners and 75 female wage-earners and paid \$466,148 in wages. Of 3,473,909 skins dressed and dyed, 1,615,520 were muskrat and 649,836 rabbit. The foreign trade in dressed furs throws further light on the situation. In the period from 1909 to 1913, Canada exported to Great Britain in 1912, the most important year, \$10,147 of dressed furs and in 1911, the least important year, \$1,827. During the period from 1921 to 1924, exports were \$30,902 in 1924, the most important year, and \$13,119 in 1922, the least important year. In the earlier period, Canada exported to the United States \$41,413 in 1909, the most important year, and \$11,420 in the least important year, 1913, as contrasted with the latter period in which she exported to the United States \$48,194 in 1923, the best year, and \$7,748 in 1924, the worst year. Canadian exports of dressed furs increased slightly to the United States and materially to the United Kingdom. Fluctuations were pronounced in both cases. Imports from the United Kingdom in wholly or partially dressed furs reached the high point of \$384,094 in the early period in 1913 and the low point of \$177,877 in 1909. In the later period the high point of \$82,775 was reached in 1921 and the low point of \$36,869 in 1922. Imports from the United States in the early period reached the high point of \$325,113 in 1913 and the low point of \$169,789 in 1909. In the later period the highest point was \$538,035 in 1922 and the lowest point \$282,331 in 1924. Imports of dressed furs from the United Kingdom declined rapidly and from the United States increased slightly. If we allow for the change in price level, foreign trade in dressed furs to the United States increased slightly in both exports and imports. Foreign trade with Great Britain increased rapidly in exports and declined rapidly in imports. Canada shared in the general shifting of fur manufactures from Europe to North America.

With undressed furs the evidence does not show con-

clusively the development of Canadian industry, but rather the increasing importance of the United States as an importer. In foreign trade Canada exported to the United Kingdom \$2,628,994 in the high year of 1913 and \$1,071,313 in the low year of 1909. In 1923 exports totalled \$4,743,986. Exports to the United States were \$1,257,976 in 1909, and \$2,184,275 in 1913, and increased to \$11,290,514 in 1923. Exports to the United States increased materially and to the United Kingdom slightly. Imports from the United Kingdom were \$379,194 in 1913 and \$136,346 in 1909. In 1923 imports declined to \$48,518. Imports from the United States totalled \$3,561,227 in 1913 and \$1,939,755 in 1909. In 1923 they had increased to \$5,089,114. Imports increased slightly from the United States and declined rapidly from the United Kingdom. Exports of undressed furs to the United States increased rapidly and imports increased slightly. Exports to the United Kingdom increased slightly and imports declined rapidly. The United States became an increasingly important market for Canada's undressed furs. Canada became less dependent on the United Kingdom for raw furs, and apparently North America was becoming more independent of Europe.

In the foreign trade in manufactured fur goods, Canada exported to the United Kingdom \$25,266 in 1913 and \$12,776 in 1909. In the later period Canada exported \$146,078 in 1921 and \$17,225 in 1923. Exports to the United States were \$35,207 in 1913 and \$7,804 in 1909. In the later period exports were \$51,301 in 1922 and \$23,644 in 1924. Exports increased slightly to both the United Kingdom and the United States. Imports from the United Kingdom were \$445,317 in 1913 and \$227,071 in 1909, and in the later period \$48,042 in 1921 and \$27,744 in 1923. Imports from the United States were \$325,113 in 1913 and \$169,789 in 1909, changing to \$95,778 in 1921 and \$60,666 in 1924. Imports of manufactured fur products declined materially from both the United States and the United Kingdom, while

exports increased slightly. Canada became to a marked extent the manufacturer of her own fur goods.

The importance of the fur goods industry is shown in the *Report on the Fur Goods Industry in Canada*. In 1924 there were 218 individual establishments reported, of which 115 were in Ontario, 67 in Quebec, and 16 in Manitoba. The capital investment was \$9,910,979, an average of \$45,463; the total number of employees on wages was male, 930, female, 1,058; total wages, \$1,916,421; cost of materials, \$7,344,156; and value of products, \$12,265,371. The products of greatest value were ladies' fur coats and jackets, \$6,854,936, and stoles and other neckwear, \$918,437. Custom work, repair work, and storage contributed the important total of \$2,782,645. Capital investment for Canada included: \$2,276,573 in land, buildings, and machinery; \$4,788,658 in materials on hand and stock in process. The relatively small amount invested in machinery and tools and the large amount of materials on hand are significant testimony to the character of the industry. The cost of raw furs and skins used in the process of manufacture was \$1,866,983, and the cost value of dressed furs and skins \$4,029,891. Power was obtained primarily from electric motors, of which there were 249 in the trade, with a capacity of 337 horse power. The industry is essentially dependent on small units of power and on adequate numbers of skilled labourers. Of 218 establishments, 153 employed less than 10 persons and 37 from 10 to 20 persons. Of these establishments 62 produced goods valued at less than \$10,000, 42 between \$10,000 and \$20,000, and 44 between \$20,000 and \$50,000. To a very important extent Canada has extended the dressing and fur goods industry following the developments incidental to the war. There are indications that the expansion has been too rapid in the slight decline from 1922 to 1924.

The importance of skilled labour to the development of fur manufacturing cannot be overemphasized. American expansion has been dependent to a very large extent on the immigration of skilled workmen, and a glance through the

names of important American fur dealers leaves a distinct impression¹ of the importance of German workmen. During the war the immigration of high-class dressers and dyers seriously affected English manufactures and proved of the utmost value to the American trade.

The increasing importance of the fur industry to North America is illustrated in part by the growth of organizations designed to protect its interests. In 1898 the Fur Merchants Credit Association of New York was incorporated² to improve the general business tone of the trade. In 1908 the incorporation of the dressers and dyers of New York, Jersey City, and Newark in the Fur Dressers and Fur Dyers Board of Trade³ proved an important step in correcting abuses of the trade. The Associated Fur Manufacturers⁴ were organized in 1911 and incorporated in 1912. The organization conducts a credit bureau for members, promotes the interests of manufacturers and salesmen, exchanges information, and establishes uniformity of customs and usages of the trade. The Raw Fur Merchants Association⁵ of New York was incorporated in 1914 to protect the interests of the raw fur trade. To harmonize the interests of these associations the Board of Trade of the Fur Industry⁶ was formed in 1914. Another organization to control the credit problems of the trade was formed in 1917 in the Mutual Protective Fur Manufacturers Association.⁷ A national organization of the furriers has developed more recently in the National Association of the Fur Industry. The United States has been divided into ten geographical districts, from each of which are to be appointed ten governors. The chairman of each district is a vice-president of the organization. The branches

¹See the extensive biographical notices in A. Belden, *The Fur Trade of America*, (New York, 1918).

²A. Belden, *op. cit.*, p. 50.

³*Ibid.*, p. 369.

⁴*Ibid.*, pp. 53-4.

⁵*Ibid.*, pp. 51-2.

⁶*Ibid.*, p. 55.

⁷*Ibid.*, p. 334.

of the industry include (1) collectors and shippers of raw furs, (2) raw and dressed fur dealers, importers, exporters, public fur sales, commission houses and brokers, (3) dressers and dyers, (4) wholesale manufacturers, (5) jobbers, (6) retail manufacturers, retailers, fur departments of stores. A representative of each group acts on the board of governors. The groups are subdivided according to capital investment. Class A—\$1,000,000 and over. Class B—\$500,000 to \$1,000,000. Class C—\$250,000 to \$500,000. Class D—\$100,000 to \$250,000. Class E—\$35,000 to \$100,000. Class F—\$35,000 and under. The treasurer of each subdivision is a member of the board. The aims of the organization include legislation for conservation purposes in various states, the study of methods to increase sales, and the creation of good will for the fur industry.

The growth of associations in the fur-trade has been partly the result of certain tendencies toward localization. The larger cities constitute the important consuming centres of fur goods. The effects of changes in fashion necessitate the closest possible relationship between the retailer, the manufacturer, the dressers and dyers, and the raw fur dealers. In the United States, New York has approximately 275 fur merchants dealing in raw, dressed, and dyed skins, or about nine times the number engaged in the next most important fur centre. The number of fur manufacturers¹ in New York, excluding makers of fur caps, robes, and heads, totals 1075; Chicago, 168; Philadelphia, 101; Boston, 60; Milwaukee, 36; Detroit, 28; Baltimore, 27; Cleveland, 24; Buffalo, 23; San Francisco, 20; Seattle, 13. The advantages of localization are shown further in the location of a large number of fur dealers in the same section of the city—raw fur dealers, importers, exporters, dyers and dressers, and manufacturers. Specialization in manufacture has followed—in ladies' garments, men's coats, hats, and gloves. Specialization in the quality of furs—fine furs, seal, fox, marten, made exclusively into high priced goods—medium-priced furs for general con-

¹*Ibid.*, p. 45. See also *Fur Buyers' Directory, 1924-5* (New York).

sumption, muskrat, Chinese goats, dogskin — is typical. Specialization as a result of climatic and geographic factors is also evident. St. Paul and Milwaukee specialize in the production of men's heavy fur coats for sale in the Northwest.

The dressing and dyeing and manufacture of furs has shifted to a very appreciable extent to North America, especially since the war. In spite of the overwhelming importance of skilled labour throughout the industry, the increasing population of North America has been of dominant importance. The increasing demand for furs has led to the development of the fur industry through the migration of skilled labour from European countries. The demand for large quantities of furs and the increase in the supply of cheaper furs have facilitated the increase in the use of machinery. Progress in industrial chemistry and the development of synthetic dyes have also had an influence. Undoubtedly further chemical research and increasing use of machinery will greatly strengthen the position which North America attained during the short period of the war. On the other hand, skilled labour must continue to remain of the utmost importance. Europe will probably continue to hold a prominent position in handling the finest furs, and in the manufacture of the highest-priced products, because of her skilled labour.

V. MARKETING ORGANIZATION

The general trend of manufacturing development has been of fundamental importance in the realignment which has taken place in marketing organization during the past half century, and especially since the beginning of the war. It has been found impossible in the discussion on manufactures to avoid a discussion of sales organization.¹ On the other hand, the importance of marketing organization warrants a more thorough treatment.

Primarily, fur is a commodity obtained over vast, inaccessible, thinly populated, northern areas during the winter seasons. The lightness, scarcity, and value of fine furs as a commodity are prerequisites essential to trade. The commodity is brought from these areas, chiefly by water transportation after the opening of navigation, to densely populated north temperate areas. The increase in population, through the spread of colonization and settlement throughout large proportions of these northern areas following the discovery of America and the opening up of Siberia, has been the important factor in the changes of marketing organization in the fur-trade. Prior to the settling of these areas a large closely knit organization was essential for the careful planning and exporting of supplies and the importing of furs during the navigation season. In thinly populated areas, with limited means of transportation, dependence on water navigation was inevitable. Long voyages to the important land areas, increasingly heavy expenses with penetration to the

¹Mr. G. H. Simpson, in a study of "The sales organization of the fur-trade", in the possession of the department of University Extension, University of Toronto, has given a description of the marketing organization of some of the more important countries. He has included not only the sales of raw furs, but also of the finished product.

interior, and increasingly long upstream voyages with supplies, and the length of time involved in the transport of supplies and furs in the interior, necessitated heavy investment of capital, control by joint stock companies, cut-throat competition, and its natural sequence, monopoly. The collection of large quantities of raw furs was dependent on long rivers with extensive tributaries draining wide areas. The mouths of large rivers were strategic points for the conduct of the trade. The importance of these strategic points was a factor responsible for the numerous wars between nationalities and the close relationship between the joint stock companies and the governments concerned. The present marketing organization of the world is closely dependent on historical background. The continuity of trading organization has been conspicuous, especially during the pre-war period.

In Siberia, trappers banded themselves in associations varying in size from six to forty men, left in the autumn for the trapping grounds, and returned with their furs for the market in December or early in the following year. The character of the hunt varied in part with the animals caught and with the nature of the country.¹ The furs were taken by merchants, merchants' agents, and by individual traders and trappers to the fairs of Russia.² Three important fairs³ tapped the trade of Siberia (i) Ostrownoje: (240 verst from Nishne-Kilymak), beginning at the end of February; (ii) Gijiga in March; and (iii) Anadyr. Larger fairs in turn brought together the furs which had been traded at various smaller fairs. Irbit⁴, at the confluence of the Irbit and Niza rivers, has held an annual fair since 1643. This fair was held

¹Joseph Klein, *Der Sibirische Pelzhandel* (Bonn, 1906), pp. 32-36.

²H. Lomer, *Der Rauchwarenhandel* (Leipzig, 1864), pp. 38 ff. Statistics on the amount of trade carried on at the various fairs are included in the description. See A. Belden, *The Fur Trade of America*, pp. 441-5, for a description of the present situation. For a further description of fairs see H. Poland, *Fur-bearing Animals in Nature and in Commerce* (London, 1892), p. liv-lvi.

³Joseph Klein, *op. cit.*, pp. 87-93.

⁴*Ibid.*, pp. 93-99.

in February (about February 8 to March 10) and was important for its sale of winter-caught furs. Numerous fur companies were represented, and large numbers of furs were bought to be resold at Leipzig and London. Chinese and Russian furs were exchanged at Kjachta,¹ usually in August. Niji-Novgorod (near the confluence of the Volga and the Oka rivers) absorbed large numbers of furs not disposed of at the earlier fairs. The fair was held from August 6 to September 6. Numerous fairs were held at various points throughout Russia—each specializing in the furs produced in the immediate area, and serving as an outlet to Russia's total production. Vladivostock, Nikolaevsk, and Khabarovsk were important outlets to Kamchatka and the neighbouring territories. The general tendency is shown in the collection of furs and their exchange for provisions and supplies passing through strategic centres to the outside consuming world. The construction of railways and increase in settlement have seriously affected the marketing organization and decentralized the trade. At present furs are exported to important world sales by a government monopoly.

In the transfer of furs from Asia to Europe, Leipzig² occupied a dominant position. Of the average total world production for three years from 1907 to 1909, it was estimated that of 360 million marks 160 million marks were traded at Leipzig. Three fairs were held, in January, April, and September. The business was conducted by upwards of one hundred fur merchants,³ specialists in various furs and classes

¹*Ibid.*, pp. 99-107.

²For a description of the importance of Leipzig, see H. Lomer, *op. cit.*, pp. 41-46. On the present situation in Leipzig see H. Clad and W. Lange, *Der Rauchwarenhandel und seine Beziehungen zu Leipzig*, (Leipzig, 1923), *passim*.

³An interesting description of the abilities of a commission agent and a merchant is given in H. Lomer, *op. cit.*, pp. 101-109. They must be able to speak and write several languages. The merchant must have a thorough knowledge of world production, world trade conditions in general, and the fur-trade in particular. He must have extensive foreign connections, ample capital, and credit. He must be an efficient organizer, and have a thorough grasp of the customs and practices of the trade.

of furs, and commission agents trading for foreign houses. The furs were purchased for home consumption and for export. The auction sale has never been successful. In 1875, Joseph Ullmann, an important fur dealer in the United States, inaugurated two annual sales in January and September at Leipzig for American furs, but the arrangement was discontinued at the end of four years. The elaborate marketing organization which had grown around the dressing and dyeing industry at Leipzig as a centre for an important share of Russia's export trade and also of North America's surplus was disastrously affected by the war. Undoubtedly, its accessibility to Russia will remain as a dominant factor in its post-war revival, but a return to its pre-war position will be slow.

The accessibility of London to North America as a producing centre has been an important factor in its development. The Hudson's Bay Company has been an outstanding example of the benefits of this geographic advantage. This organization has conducted sales as an outlet for furs produced in Canada. The sales are held three times a year at the Public Sales Room on College Hill, in January, March and October. As has been pointed out the greatest possible care is essential in grading the furs brought from the posts. The catalogue has details as to the time and place of sale, numbers of furs to be sold, conditions of sales, and descriptions of each lot including the place of origin¹, the grades and number of furs. The same standards of grading are maintained from season to season, unless due notice has been given to the trade, and every precaution is taken to ensure confidence in the Company's furs. Grading is a highly skilled occupation, and has been for approximately a century in charge of representatives of four generations in the same

¹For a list of abbreviations designating places of origin, see E. Brass, *Aus dem Reiche der Pelze* (Berlin, 1925), pp. 375-6. Interesting information on the characteristics of the fur from various districts is also included, pp. 377-9. See also H. Poland, *op. cit.*, *passim*.

family. In the warehouse¹ the ground floor is reserved for muskrat; the first floor for sundry furs, such as skunk, squirrel, hair seal; the second floor for beaver and otter; the third floor for the more valuable furs, such as marten, mink, fisher, lynx; and the top floor, which has the best available light, for foxes, wolves, polar bear. A fur show is held during the week prior to the date of auction, to allow dealers to become acquainted with the merits of various lots. The auctions are held in the sales room, and the auctioneer, with the assistance of brokers, sells the various lots from the catalogue.

In recent years the sales of the Hudson's Bay Company have been coördinated with the sales of furs by other houses. The fur warehouses are located in close proximity to College Hill, and dealers are able to visit each sale in turn. A custom has grown up according to which the first goods to be sold are those from China and the Far East. The Australian offerings follow immediately, and the sale of fur seals on the market concludes the first week. On Monday of the second week the Hudson's Bay Company's sales are begun. The furs are sold without a break, and consequently afford an excellent index of the state of the market. The latter part of the week is taken up with the sales of fine furs from other companies. During the third week, staple lines are offered, and in the fourth and final week South African and lower grade skins are sold.

Furs sold by other companies are handled largely on a commission basis. Indeed, the actual arrangement in the Hudson's Bay Company is a charge of 5 per cent. by the London sales office for the handling of the furs allocated to the producing districts. The growth of the American Fur Company in the United States and the marketing of the furs in England led to the development of the commission house of C. M. Lampson and Company. Sir Curtis Lampson had been sent as a representative of the American Fur Company

¹See an interesting description in the *Beaver magazine*, April, 1921; also E. Brass, *op. cit.*, pp. 371-4.

to London and had developed a large and substantial organization. After the reorganization of the Hudson's Bay Company in 1863, Lampson became a deputy governor,¹ and consequently brought under effective control practically the whole of the fur-producing area of North America. With the disappearance of this arrangement, large numbers of competitors of the Hudson's Bay Company sold through the Lampson house on a commission basis. Furs sent from North American shippers were sorted, graded, and auctioned in a manner calculated to ensure the confidence of the purchasers of raw furs at auction sales. In 1912 Fred Huth and Company entered the market for American furs with the establishment of public sales. Other firms include Goad, Rigg and Co., Culverwell Brooks and Cotton, Flack Chandler, Anning and Cobb, and Dyster Nalder. More recently established firms handling African, Australian, Chinese, and Japanese furs are Barber and Co., Henry Kiver, Thorpe and Welby, and Eastwood and Holt.

The growing importance of the commission business in the fur-trade was significant of the far-reaching changes which had taken place in the trade in North America. The small trader was able to compete effectively with the Hudson's Bay Company on the London market. The monopoly of the Company became of less importance with increasing competition and growth of settlement in the fur-producing areas of North America. A striking evidence of this change in the fur-trade came with the announcement in June, 1921, by the Hudson's Bay Company that it would purchase furs on consignment for sale at its London auctions. The situation in which a large and reputable Company had been able to collect and market furs from its own producing areas for two and one-half centuries had changed. To preserve the importance of its auction sales and to support the London fur market more effectively with its high standards and trad-

¹Sir Curtis Miranda Lampson, Bart., deputy governor, 1863-1871. Sir William Schooling, *The Governor and Company of Adventurers of England trading into Hudson's Bay* (London, 1920), p. xv.

itions, the Company began an avowed policy of selling furs on a commission basis. In pursuit of this policy the Company purchased the warehouses and offices of the A. and W. Nesbitt Co., which had fallen into difficulties through the speculative activities of the war and post-war periods. This company had established connections for the collection of American, Australian, and European skins and for their sale at auction in London. The change in policy of the Hudson's Bay Company has proved beneficial to the London market, as well as to the companies immediately concerned.

More striking evidence of the change in methods of production and in the character of the trade has been shown in the revolution of the marketing organization in North America, especially since the war. The development of dressing and dyeing and of the manufacturing industry, and the rapid increase in settlement, have had a pronounced effect on sales organization. In the United States raw furs had been sent to the European commission houses, especially those in London and Leipzig. Furs were collected from trappers and farmers by small country buyers, and sent in turn to the larger fur centres. The large centres were strategically located for the shipment of furs. They had the advantage of a fur organization which continued from an earlier period. Dressing and dyeing and manufacturing had been concentrated in these centres, partly through the large population immediately available, and partly because of the accessibility of raw furs. St. Louis¹ had been an important fur centre through its central location and through its location at the junction of the Missouri and the Mississippi, which gave access to a large territory. Furs were sent by large numbers of trappers and local buyers to commission houses in these centres, to be sold in turn for local consumption, for national consumption, or for export to the European sales. With improvement of transportation and communi-

¹For an interesting and valuable description of the position of St. Louis in the fur-trade, see Isaac Lippincott, *A century and a half of fur trade at St. Louis*, (Washington University Studies, Volume III, Series IV, Part II, pp. 205-242).

cation facilities and the increase in population larger numbers of trappers and local buyers were in a position to send returns direct to the commission houses. Farmers engaged in trapping as a side line during the winter, and sent furs to the numerous buyers. The immediate result of the rapid change was shown in unsatisfactory market conditions.

Collecting firms sent price lists to large numbers of trappers and traders. The lists included details as to the grades and as to prices paid for each grade. Each list varied in meaning depending on the policy of each purchasing house—liberal prices were offered, and the furs were closely graded on receipt, or low prices were offered, and the furs graded more liberally. The results occasioned considerable complaint from trappers, since they were not in a position to protest effectively against the grades or against the prices. The purchasing house was in a position to protect itself against price fluctuations at the trappers' expense. Two policies had developed. The "Western" assortment gave a large number of grades and prices. The buyer was in a position to pay liberally for high grades, and to pay low prices for medium and low grades to reimburse possible losses. Shipping charges and 5 per cent. were deducted from the amount sent to the seller. The "Eastern" assortment, or one price method, gave few grades and one price for each grade, and shipping charges were paid by the purchasing company. The latter method has found greater favour among shippers of furs. It is alleged that buying firms on a low market prefer to purchase on the "Western" assortment basis and to sell on the "Eastern" basis. The net result has been general dissatisfaction with the methods of marketing. Grading was not carried out with the greatest accuracy, and the trade was generally in a state of uncertainty.

As a result of this uncertainty, large numbers of trappers and local buyers brought their furs directly to the larger houses in the important fur centres and with competition secured more favourable returns. Various houses despatched travelling agents to the local centres to buy direct from the

local dealer and trapper, or established local and permanent branch houses. The large houses in turn sold the furs in London or Leipzig, paying the London commission of 6 per cent. plus freight, insurance, and express, or 10 per cent. for light furs and 12 to 15 per cent. for heavier furs. Other houses followed the policy of selling direct to the manufacturer, or the manufacturer became a direct purchaser of raw furs, such as was the case with Revillon Frères. The large number of raw fur collecting houses and manufacturers and the increasingly specialized character of manufacturing have led to the growth of the fur brokerage business. Fur brokers establish close relationships with raw fur dealers, dressers and dyers, wholesalers and manufacturers, and act as intermediaries in the exchange of furs between the various houses. The fur broker has become of greater importance with the establishment of auction sales in the United States in arranging for the transfer of furs between European and American auctions.

Raw fur collecting was originally centred to an important extent in the hands of commission merchants in St. Louis and New York. In St. Louis, Funsten Brothers and Company¹ began as fur commission merchants in 1881, and were incorporated in 1893. Furs were sent to the company by trappers and disposed of by sealed bids at tri-weekly sales to St. Louis fur dealers. The purchasers sold the furs in turn to fur manufacturers and merchants and to the European auctions. In 1913, the company sold fur seals at auction for the American government. The outbreak of the Great War shut off the Leipzig market, and seriously affected London's position. American raw fur merchants were left without a market and without a guide as to general prices. Prices declined, trapping was discouraged, and the market temporarily disorganized. After a year of uncertainty an attempt was made to determine a basis of prices for trade in the establishment of public auction sales. In 1915, Funsten's established and conducted public auction sales in January,

¹A. Belden, *op. cit.*, pp. 83-4.

March, and September. In November of the same year the New York Fur Auction Sales Corporation was incorporated with \$1,000,000 capital. At the first sales in January, 1916, heavy offerings were made and the purchasing power of the American public brought satisfactory results. The experiment was continued in March and proving equally successful New York auction sales have become thoroughly established. A basis of fur prices for the trade was determined and the general feeling of uncertainty ended. The disappearance of Russia and a large part of Europe as producing areas had a steadying effect on prices and was responsible for a marked rise. Increasing prosperity in the United States as a result of the war greatly strengthened the demand.

In 1920 the Canadian Fur Auction Sales Company, Limited, was incorporated with a capital of \$5,000,000 to conduct auction sales in Montreal. Trappers and collectors send furs to the warehouse in Lagaucheterie St. West, where they are appraised, cleaned, graded, and put up in lots for auction. The consignor has the privilege of drawing on the Company to within 50 per cent. of the appraisal value in advance of the sale. The furs are auctioned in the ball room of the Mount Royal Hotel by the auctioneer and assistant spotters. A commission charge of 5 per cent. is made, and the purchaser is required to pay 25 cents per lot and a brokerage charge of $\frac{1}{2}$ of 1 per cent. of the purchase price. The purchaser also pays a packing charge according to a fixed schedule depending on the variety of the fur. Charges on silver fox are 75 cents for the first lot and 25 cents for each additional lot. Heavy furs are charged at \$3.00. Since 1920 these sales have become increasingly important in handling the returns of numerous trappers and traders. Several smaller sales companies have been organized with varying results. In 1922 a fur exchange was organized in Edmonton with a capital of \$20,000. A charge of 5 per cent. is made on all transactions up to \$1,000 and 4 per cent. above that amount. The exchange is open every Wednesday, and larger sales are held every month. The members of the

exchange include most of the important buyers. The organization, on the other hand, must compete with numerous large buyers who are willing to give ample floor space to trappers and small traders unwilling to pay the commission. The Edmonton Raw Fur Merchants Association includes local traders anxious to aid the trapper and small operator in disposing of his furs. Winnipeg has also inaugurated an Auction Sales Company with interesting results. The Northern Trading Company has fostered the enterprise by selling its furs on this market at various times.

The development of the auction sale in North America has originated in the necessity of establishing dependable grading systems. It is hardly probable, however, that the establishment of auctions in North America will seriously affect the ultimate trade of European auctions. It is quite possible that the introduction of an efficient marketing system, which has long since been overdue, may strengthen the position of the European markets in disposing of the world's produce. There are, moreover, signs of a relapse in the post-war American marketing organization which may further strengthen Europe's position. In St. Louis, the disregard of efficient grading is still an important feature. Furs are sent by small trappers from all parts of the United States, and paid for on the basis of the price lists issued by various firms. The furs are graded and the price returned in cash or in trapping supplies, since the commission house is usually a supply house as well. But the furs are arranged on the floors of the sales room according to the species of animal and sold at auction under sealed bids and in irregular sized lots. The buyer at auction must base his bid on a cursory examination of all the furs in the lot. The trapper must accept a grade which the buyer at the auction refuses to recognize. The commission house which rests between the upper and lower mill stones of the fur-buyer and the trapper will probably protect itself at the expense of the trapper. It can hardly be expected that this inefficient system of marketing will dis-

place the efficient grading of such organizations as the Hudson's Bay Company.

The changes in marketing organization are a part of the general trend which has been shown in production, prices, regulation, fur-farming, and manufacturing. On the other hand, they are closely related to a changing phase in western civilization, and illustrate more clearly than possibly any other instance certain wider trends. The spread of the price system can seldom be seen so distinctly. In North America the price system has spread with the development of uniform monetary institutions, the increase in education through the growth of the public school system, the rapid improvement of transportation and communication facilities, and the concurrent machine industry. The spread has proceeded unevenly, penetrating lastly to the more remote districts. Since fur is essentially a commodity produced in the more remote areas and consumed in the larger industrial areas, its marketing organization has been closely related to the price system. The price system has been retarded by the discrepancy between the cultural background of large numbers of fur producers, as with the Indians, and the culture in which it has had its rise and development. Moreover, the characteristics of the commodity forbid a precise standardization, such as the price system demands for a rapid growth. The variations in rapidity of the spread of the price system throughout the trade has been an additional factor limiting its growth. Advantages to be gained through these discrepancies were the causes of attempts to prevent further change. Monopoly control, of which the advantages were based partly on discrepancies in the spread of the price system, was a significant factor in maintaining a *status quo*. The effect of these retardations on the marketing organization has been pronounced. The spread of competition to the most remote areas and the concurrent spread of the price system has been an important factor leading to the establishment of a more efficient marketing organization, but the trade has been remarkably slow in yielding to modern demands. Even yet the more remote

areas have to a large extent escaped. But the penetrating power of the price system and the modern technique¹ is cumulative.

¹The radio represents the latest attempt. Fur prices are broadcasted and picked up in the most remote districts of the Yukon and Mackenzie Rivers. By following the trend of the market from week to week, the fur-trader in remote districts is able to buy from the Indian accordingly.

VI. SUMMARY

From a discussion of the various aspects of the modern fur-trade certain conclusions have emerged which appear to have a dominant importance. Prices of furs have increased materially during the past half century and most conspicuously for the scarce and more valuable furs. Production has increased rapidly especially in the case of cheaper furs. The more valuable furs have shown a tendency to decline. As a result of these factors protection regulations for the more valuable fur-bearing animals have become increasingly evident. A further attempt to increase the supply of more valuable furs has been shown in fur farming.

The causes of these phenomena are difficult to determine. Population in the temperate zones has increased appreciably during the past seventy-five years, but not sufficiently to explain the general change. The significant factor has not been the actual increase in population, but rather an increase in the numbers of the population wearing furs and an increase in the number of furs worn by the population. These factors depend on certain cultural factors incidental to western civilization. The marked improvement in transportation facilities as shown especially in the automobile industry has doubtless had its effect in stimulating a demand for furs, but it hardly appears to be of dominant importance. There are certainly other contributing factors. The change in manufacturing methods has been partly responsible. The advance in industrial chemistry as shown in the manufacture and application of synthetic dyes has made possible the adaptation of furs to changes in fashions. As a result fur has become another commodity which contributes to the possibilities of new fashions. It has been used increasingly as trimming for dresses since the dye and fur manufacturing industries have made it possible to coördinate furs with prevailing styles. Consequently changes in fashions have

been responsible for a marked increase in the business of renovating furs, but more conspicuously in the demand for furs adaptable to the manufacture of new styles. With improved transportation and communication facilities fashions have become more important to larger numbers of people. The increase in the number of women's magazines, the increasing effectiveness of advertising, and the growing importance of departmental and mail order houses, have had their effects in stimulating demand. All these factors have in turn led to the introduction of cheaper furs, to the introduction of machinery on a larger scale, to heavier capital investment on the part of manufacturers and to the necessity of securing an adequate supply of raw material as well as an adequate market. More recently manufacturers through organizations and associations have consistently developed the market. The increased purchasing power, especially of the United States, has been a factor permitting these developments.

So far as the supply of fine furs is concerned, these factors suggest interesting conclusions. This supply may be said roughly to be limited to northern North America and northern Eurasia. In both areas increasing settlement, increasing demands for lumber for building purposes and for pulpwood, increasing possibilities of agricultural and mineral activities have seriously affected the supply and threaten further encroachments. In other words, the prospects of a constant and increasing demand are faced with a prospective and constantly decreasing supply. This tendency will probably become cumulative, as has been the tendency with fur-bearers at present almost extinct—the high price of fur leads to more excessive trapping.

There is little possibility of increasing the supply of furs through the opening of new territory. New methods¹ of

¹The discovery of methods of deodorizing skunk skins by Adolph Bowsky, a New York fur dresser, in 1869 (A. Belden, *The Fur Trade of America* (New York, 1918), p. 200), and the development of methods of dressing and dyeing the American weasel during the war, may be cited as examples.

manufacture and dyeing cheaper furs occasionally lighten the pressure on finer furs, but demand is persistent. Fur farming will increase the output of fine fur but as yet the outcome cannot be predicted with certainty. The great bulk of the world's fine fur will continue to be produced by wild fur-bearers. The supply of wild animals is at present the crucial factor. Trapping methods may be improved, but at the risk of exhausting capital resources. Increasing effectiveness of the price system may stimulate increased trapping with similar results. So far as Canada is concerned, the price of fine furs will probably continue at its present high level. We shall expect increasing regulations and increasing attention to fur farming. As yet the probability of actually increasing the fur supply of Canada and the value of this important asset through constructive investigation and legislation furthering the conservation and increase of natural resources in new countries is notoriously slight. The tendencies which have been noted in the fur-trade during the past half century will probably continue with undiminished strength.

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APPENDICES

APPENDIX A

EXPORT OF FURS IN THE FRENCH PERIOD

Year	Number of Livres of Beaver ¹ Received by the Companies.	Value of Furs ²	Remarks
		Received at La Rochelle. Livres	
1626	12-15,000		
1645	20,000		
1675	61,000		
1676	70,000		
1677	92,000		
1678	80,135		
1679	68,080		
1680	69,000		
1681	82,900		
1682	90,353		
1683	95,489		
1684	49,056		
1685	137,568		
1686	av. 140,000		
1687			
1688			
1689			
1690			
1691			
1692			
1693			
1694			
1695			
1696			
1697	204,609		
1698	163,000		
1699	296,000		

¹These statistics have been extracted from (Can. Arch.) C 11 A.

²Statistics cited E. Salone, *La Colonisation de la Nouvelle France*. (Paris, n.d.) pp. 397-8.

Year	Number of Livres of Beaver Received by the Companies	Value of Furs Received at La Rochelle Livres	Remarks
1700			{ 29077.9 Castor gras d'hyver 1583.8 Muscovite & 5333.15 sec hyver.
1701	75,993.32		
1702			
1703			
1704			
1705			
1706			
1707			
1708			
1709			
1710			
1711			
1712	73,377		
1717	146,395 21 oz.		25 congés issued.
1718		262,223	
1719		776,383	
1720		431,148	
1721		389,804	
1722	166,000 (approximate)	752,873	120,000 shipped 32,000 sec in warehouse 14,000 gras in warehouse This large number is the result of accumulations through hold- ing back of furs by merchants looking for a continuance of free trade
1723	119,623	801,123	648 ballots sec 77,760 livres 330 " gras 39,600 " 2 " veule 236 " 20 " Moscovie 2,027 "
1724		638,604	
1725	42,000 (Average Montreal receipts)	521,334	
1726	98,080 (Montreal receipts)	211,952	29,640 gras 67,956 sec 484 veule, etc.
1727		2,096,392	
1728	148,000 (Approximate)	1,307,494	

Year	Number of Livres of Beaver Received by the Companies.	Value of Furs Received at La Rochelle Livres	Remarks
1729 ¹	127,640 6 oz.	1,379,646	25 concessions granted for poor families.
1730	161,267. 8 oz.	1,411,285	A very good year.
1731		1,161,827	
1732	170,000 (Approximate)	1,014,469	
1733	221,000 (Approximate)	1,191,989	Ascribed to rise in price of English goods at Oswego.
1734	150,000 (Approximate)	949,815	Les Scioux and La Mer de l'Ouest produced 15 to 20,000 in 1734 and nearly 75,000 in 1735, offsetting a decline due to Indian wars.
1735	177,649. 8 oz.	920,937	Reduction of previous year ascribed to reduction in price of bad beaver. Indians took bad beaver to English and also good
1736	94,000 (Approximate)	653,718 ²	
1737	124,000	632,763	Complaints of higher French prices and better goods (rum, kettles, blankets) at Oswego.
1738	131,000	1,084,958	
1739	147,000 (Approximate)	1,035,216	131,198 livres exported. Post of La Baye 110 paquets, ordinarily 3 to 400 paquets.
1740	128,400 or 1,070 ballots	981,806	
1741		1,044,836	Conges sold for 17,494 livres ranging in value from 24 livres to 3,000 livres
1742	160,000 (Approximate)		

¹Recette Generale des Castors Receu dans le Bureaux de la Compagnie des Indes en Canada, 1729.

	Montreal	Three Rivers	Quebec
gras hyvert et vert	22,080	1,269.15	5,386.5
sec hyvert et autres	77,627.2	4,443.2	16,383.14
Total	99,707.2	5,713.1	22,220.3

²Wreck of the vessel Renommée with loss of 126,848 livres.

Year	Number of Livres of Beaver Received by the Companies.	Value of Furs Received at La Rochelle Livres	Remarks
1743	112,080		15,000 capot de castor. Conges sold for 12,232 livres 13 sous. Posts leased March 26, 1743: Temiscamingue 5,600 Michipicoten 3,750 Wiatanons 3,000 La Baye 8,100
1744	200,000 (Approximate)	1,937,720	A good hunting year—lack of snow.
1745	180,000 (Approximate)		Farmers asking to be discharged from posts because of high price of merchandise.
1746	188,585. 15 oz.	248,137	
1747	150,919	980,084	
1748	166,172. 3 oz.	778,528	
1749		2,803,679	
1750		1,211,010	
1751		970,869	
1752		3,084,501	
1753		636,673	
1754	132,451	3,932,127	Temiscamingue farmed for 4,400 livres.
1755	148,998		Exported to France.
1756		151,937	
1757		1,988,869	
1758		577,312	
1759		704,536	
1760		256,020	
1761		532,025	

Note the pronounced fluctuations in the supply of beaver and in the value of furs received at La Rochelle. Various reasons have been suggested. Wars were undeniably important; changes in regulation policy, in seasons, and in the effects of competition were also significant. It is noteworthy that the supply of beaver has not fallen off appreciably although other furs have become increasingly important, see a detailed list of the number of other "pelletteries sorties pour France en 1754" and "en 1755", reproduced on next page. For earlier comments on these furs see for marten *Can. Arch. C 11 A, Vol. 31 (1710), pp. 267-268*, P. F. X. Charlevoix, *Journal of a voyage to North America*, ed., L. P. Kellogg (Chicago, 1923), pp. 183, 184, 192, 193, also P. Boucher, *Canada in the seventeenth century* (Montreal, 1883), pp. 35-40.

Shelburne MSS., vol. 64.

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Pelleteries sorties pour france en 1754

		ll	s		ll	s	d.
Martres du Nord	8586 peaux à	5.	10.	47223.	-	-
Martres du Sud	30029	à 3.	10.	...	105101.	10.	-
Visons	1667	à 2.	10.		4167.	10.	-
Loups cerviers	5411	à 10.	-	.....	54110.	-	-
Chats cerviers	1008	à 4.	-	.....	4032.	-	-
Renards rouges	1094	à 4.	-	.....	4376.	-	-
Renards argentés	6	à 12.	-	.....	72.	-	-
Renards croisés	183	à 6.	-	.....	1098.	-	-
Renards du Sud	1783	à 3.	10.	.....	6240.	10.	-
Pichoux	5167	à 4.	-		20668.	-	-
Loutres	9129	à 10.	-		91290.	-	-
Peccands	3216	à 7.	10.	.....	24120.	10.	-
Peaux d'Ours	10761	à 10.	-		107610.	-	-
Oursons	4507	à 5.	-	.....	22535.	-	-
Chats ou Marmottes	84037	à 2.	2.		176477.	14.	-
Loups de bois	1139	à 5.	-	.....	5895.	-	-
Carcajoux	207	à 6.	-	.....	1242.	-	-
Loups Marins	323	à 1.	10.	.....	484.	-	-
Rats musqués	7142	à -	5.		1785.	10.	-
Rats de bois	83	à -	5.	.....	20.	15.	-
Ecureuils	1488	à -	2.		148.	16.	-
Siffleurs	15	à -	1.		-	15.	-
Chevreuils passés	123852	à 2.	-		247704.	-	-
Chevreuils verts	15318	à 3.	-	.....	45954.	-	-
Cerfs verts	3260	à 16.	-	.....	52160.	-	-
Originaux verts	998	à 20.	-		18160.	-	-
Originaux passés	18	à 5.	-	.....	90.	-	-
Castor Sec hyver	107090	à 4.	-	.....	428360.	-	-
Castor gras hyver	14943	à 4.	-	.....	59772.	-	-
Castor d'été	9378	à 1.	10.	14067.	1.	-
Rognons de Castor	1040	à 3.	-	3120.	-	-
					<hr/>		
					1547885. ll	11 s.	-
					<hr/>		

(A true copy)

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p. 164 Endorsed:—

No. 7.

Quantity of Furs Exported in
1754, with the Quebec Prices
of the several species.

p. 165

Pelleteries sorties pour France en 1755.

					l	s.	d.
Martres du Nord	9386	Peaux à	4. l	10s.	42237.	-	-
Martres du Sud	28158	à	1.	12.	45052	16.	-
Loutres	8533	à	6.	-	51198.	-	-
Peccands	2703	à	4.	10	12163.	10.	-
Renards et Pichoux	10151	à	1.	12.	16241.	12.	-
Carcajoux	329	à	4	-	1316.	-	-
Ours	10151	à	6.	-	60906.	-	-
Oursons	3568	à	3.	-	10704	-	-
Loups Cerviers	896	à	7.	10.	6720.	-	-
Chats Cerviers	2690	à	1.	12.	4304.	-	-
Visons et Marmottes	64064	à	1	12.	102502.	-	-
Loups de Bois	1361	à	3.	-	4083.	-	-
Chats Sauvages	95722	à	1.	12.	103155.	-	-
Cerfs Verts	4095	à	12	-	49140.	-	-
Chevreuils verts	2661	à	3	-	7983.	-	-
Chevreuils passés	69450L	à	2.	La Livre	138900.	-	-
Originaux verts	615	à	18.	pièce	11070.	-	-
Rognons de Castor	1336L	à	1	5 LaL.	1670.	-	-
Loups Marins	104	à	3.	pièce	312.	-	-
Castor	1363	paquets	pezant	148,998.			
		Livres de Castor	Supposé le tout				
		Castor gras	à 4. l	La Livre	595992.	-	-
Total					1265650. l	6. s	-

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(A true Copy)

APPENDIX B

TRAPPER'S OUTFIT, 1924

AVERAGE¹ TRAPPER'S OUTFIT FOR PEACE RIVER AND THE NORTHWEST

Average outfit \$500.00—may run to \$1,500.00.

Flour	400 lbs. for year	About 1 lb a day—50 lbs for 6 weeks.
Syrup	20 lbs	
Sugar	100 lbs.	
Potatoes	Depending on locality.	
Dried fruit	100 lbs —4 boxes—or 150 lbs.	
	Prunes	} a box of each
	Peaches	
	Apricots	
	Apples	
	Raisins	
	Figs	

Sourdough pots—most important for outfit—*wooden* or *stone* jar.

Little or no canned stuff—limited to canned tomatoes—too bulky—too expensive and injured by freezing.

Baking soda—2 or 3 lbs. to 5 lbs.—with sourdough plenty of soda necessary for hot cakes.

Condensed milk—1 case, 4 doz. tins. Generally no milk taken.

Little or no Cream.

Tea 10 to 15 lbs. A little extra for trading.

Coffee More used than tea. 1 lb. a month—10 lbs. Probably average 25 lbs.

Cocoa 5 lbs.

Bacon 100 lbs. If pickled in salt must be parboiled. Sow belly. Generally mixed with beans. Well salted, most bacon with not sufficient salt. (Depends on pocket book.)

Rice 50 lbs. used especially with duck, etc. Tapioca, sago, macaroni sometimes taken, generally extras.

Corn meal 50 lbs. for dog feed—may have 100 to 200 lbs with less bacon.

Lard 20-40 lbs.

Canned butter 1 or 2 lb. tins —30 lbs. (luxury) very expensive. Depends on pocket book, sometimes done without.

¹The average trapper of course does not exist and these items will probably not suit any one taste. They are intended rather as an index of goods demanded—Compare with an estimate for Eastern Canada-1907. Martin Hunter, *Canadian Wilds* (Columbus, Ohio, 1907), pp 232-5.

Jam	8 to 10 tins—since the war. 5 or 6 four pound tins—25 to 50 lbs. jam.
Cheese	Very seldom take cheese. Kraft keeps moist. 1 or 2 boxes.
Oatmeal	30 to 50 lbs. (More if used for dogs.)
Tobacco	20 lbs. for heavy smoker. Nigger Head, T. and B., or MacDonald.
Savory	1 or 2 tins sage and mint-flavouring.
Dried onions	1 tin (5 lbs.) very useful.
Salt	10 lbs.
Pepper	2 tins—red and black—taste.
Dessicated fruit becoming more useful.	
Tallow—dog feed—50lb. case.	
Axe	
Skinning knife	
Track line for upstream travelling—cod line—must be light line—100 feet in water—necessary to be able to throw it if caught. About 180 ft.	
Yukon poling boat	For going upstream—built by trappers.
Canoe	For going downstream.
Hammer	
Handsaw	
Nails	Some use no nails. 10 to 15 lbs. 2½ in. to 4 in. Mostly 2½ in.
Assafoetidia	Oil of anise—for scent—50 cents., or 1 oz. bottle. Oil of iodine—Marten bait. Purchase of scent questionable.
Beaver castor	Cheap at posts—used for lynx.
Fish nets	3 to 5½ mesh. 30 ft. in net—for goldeyes as on Peace River—3 lb. ball of net or 100 yds. of 3½" to 4" mesh.
Small hand sleigh, toboggan or Yukon sled (with runners)	
Harness for dogs.	
Very few use more than 2 dogs. Many have 1 dog. Lots have none. Dogs expensive—money and time.	
Pots, pans, frying pans (2 or 3) one at each camp. 2 frying pans one for bacon, one for other cooking.	
Matches	doz. packages—gross—according to tobacco.
Stove	Two empty gasoline tins. Easy to pack. Have end wired to top to fall down, closing fire. Dovetail tins together—three or four cuts on top with can opener—bend back to hold stove pipe.
Brass wire for rabbits. 2 or 3 rolls. Strong picture wire doubled (No. 8) snare for lynx—Lynx snare cord-similar to trapping line.	
2 fish flies—trout, etc. Generally fish with nets.	

Clothing	According to taste. Double suit of underwear—pair of overalls, mackinaw, shirt, riding breeches popular.
Snowshoes	2 pairs. 1 pr. trailers—light snow, 1 pair big shoe for deep snow.
Moccasins	3—6 pr. Rubbers with canvas tops (summer) shoes. Winter—moccasins and heavy woollen socks.
Mitts	mooseskin.
B.C. heater—(most popular)	outside \$6 to \$10, inside \$25. Drum oven, used with B.C. heaters, made of stove pipe, fits on stove pipe—2 ft. above stove. Generally use ordinary camp stove.
1 doz. lengths 5" pipe,	3 or 4 lengths for stove and other for shelter. Make stove out of pipe (7")
½ doz. files—for axes.	
Cross cut saw—5 or 6 ft.	
60 to 100 traps at least.	Weight about 150 lbs. Best men, 150 to 200 traps.
	Nothing less than No. 1's.
	50—No. 1. Purely marten.
	10—No. 1½. Mink. Also rats.
	20—No. 2. Fox.
	10—No. 3. Lynx and beaver.
	10—No. 4. used only for beaver—heavy trap.
	5 doz. No. 1 weighs 90 lbs.
Box of candles—36 lbs.	
Winchester rifle 22 high power.	
Ammunition, \$820.00 to \$825.00—4 to 500 rounds.	
303-British sporting rifle.	
30-30—100 rounds.	
16' x 18' cabins—8' x 10' tent, or 10 x 12—12 x 14—2 windows white cotton.	
Dutch oven.	
2 or 3 axes. H.B.—one 3 lb. whole axe, two 2 lb. axes.	
Shotgun, 16 bore—ducks, geese, partridge, plarmigan, rabbits.	
For loading shells—10 to 15 lbs. powder., 10 to 15 lbs. shot.	
Canvas—boat roof.	

APPENDIX C

TRAPPERS' SUPPLIES

1. TREATY SUPPLIES 1924

	Wt. of package		Character of casing material.
Black Powder	85	lbs.	3 tins (long boxes)
Pork	90-113	"	bags
Shot	100	"	boxes
Cordage	75	"	boxes
Hardware	100	"	boxes
Saws	20	"	sacking
Drugs	20-100	"	boxes
Flour	100	"	always treaty—bags
Tobacco	40- 46	"	caddies—bulk.
Tea	50	"	boxes—1 lb. packages.
Mission supplies—Drugs, Oranges.			

2. SUPPLIES BROUGHT IN BY THE TRADING COMPANIES, 1924

Coal oil— steel barrels	120	lbs.	half drums, first time on Mackenzie River in 1924.
Gasoline—barrels—	80	"	case
Permit	48	"	box
Tobacco	35-85	"	Caddies, sacks, varying on sort of tobacco
Flour	50	"	often 2-20 lb. small sacks in 1 larger sack or 60 lbs. in 1 sack. Trappers demand small sacks.
Baking Powder	50	"	box—tins.
Candles	40	"	box
Evaporated Apples	60	"	box
Prunes	70	"	box
Jam	60	"	box (tins)
Soap	50	"	box (wrapper)
Syrup	60	"	box (tins)
Matches	35	"	box
Cornmeal	100	"	bags
Crisco	50	"	tins
Rice	100	"	bulk (bags)
Hessian	60	"	bales
Tents	90	"	bales

	Wt. of package		Character of casing material.
C. P. goods	100	lbs.	
Dry Goods	90-110	"	bales
Twine	55	"	sacking
Boots and shoes	90	"	boxes
Fish nets	40	"	boxes
Confectionery	40	"	boxes (pails)
Rubbers	50	"	boxes
Roofing (tar paper, 2 rolls each box)	124	"	crated
Hard tack	35	"	boxes
Biscuits	40	"	boxes
Cigarettes	65	"	boxes
Paper bags	25	"	boxes
Coffee	100	"	boxes (tins)
Rope			
Stove pipe	40	"	crates
Traps	100	"	boxes
Ammunition	60	boxes	
Salmon (B C.)			
Files	160	"	box
Guns	50-100	"	box
Tinware	105	"	box
Crockery	85	"	barrel
Stationery	25	"	box
Sash	70	"	box
Pipes	90	"	box
Castoria	100	"	box
Painkiller	70	"	box
Soap	50	"	box
Groceries	75	"	box
Cocoa	70	"	box
Cereals	60	"	bags
Corn Starch	50	"	box
Milk	40-50	"	box—tins
Currants	60	"	box
Dates	85	"	box—bulk
Peaches	70	"	box—tins
Raisins	40	"	box
Meat	35	"	(case)
Vegetables	85	"	box
Beans	100	"	bags
Egg powder	40	"	box
Fish	70	"	box (sardines)

	Wt. of package	Character of casing material
Wall paper	80 "	rolls (crate)
Perfume	25 "	box
Axe handles	35 "	box
Axes (H.B.)	40 "	box
Camp stoves	100 "	crated
Nails	100 "	kegs
Cutlery	95 "	box
Paint	90 "	box—pails
Dog harness	100 "	box
Picture wire	70 "	box
Rolled Oats	80 "	bags
Can. Fruit	45 "	box
Candy	110 "	box—pails
Pickles	45 "	box—bottles
Vinegar	40 "	kegs
Mushrooms	60 "	box
Can. onions	75 "	box
Honey	30 "	box—pails
Evaporated Pears	55 "	box
Barley	100 "	sacks
Sugar	100 "	sacks
lump	50 "	box—easily carried.
granulated	100 "	sacks (two sewed in burlap)
Lard	75 "	long boxes—pails
Tallow	55 "	box
Bacon	130 lb. cases	box
Ham	130 lbs.	box
Sausage	125 "	keg
Pemmican (box)	125 "	small sacks (tubs of canvas)
Stove polish	10 "	box
Soups	50 "	box
Butter	65 "	box—tins
Oranges	85 "	box—crate
Cheese	55 "	box
Oakum	50 "	bundles

APPENDIX D

MISNAMED FURS

The following list of misnamed furs, as used by the fur-trade, has been compiled by the Biological Survey (*Journal of Mammalogy*, vol. 4, Nov. 1923, pp. 216-220).

TRADE NAME	REAL NAME OF ANIMAL
Adelaide Chinchilla	Australian opossum
Alaska bear	Raccoon (dark pelts)
Alaska sable	Raccoon (dark pelts); skunk (natural black or dyed)
Aleutian seal	Muskrat (plucked and dyed)
American seal	Rabbit (plucked and dyed)
Arctic seal	Rabbit (plucked and dyed)
Astrakhan }	Persian lamb (loose curl)
Astrachan }	
Australian fisher	Wallaby (sheared and dyed)
Baltic fox	Northern hare
Baltic seal	Rabbit (clipped and dyed)
Bear	Goat (dyed)
Beaver	Coypu rat (plucked natural); or opossum (sheared and dyed)
Black fox	Black cat
Black lynx	Northern hare (dyed)
Black Marten	Skunk (dyed or natural black)
Blue Japanese wolf	Goat (dyed)
Brazilian mink	Marmot (blended)
Broadtail	Persian lamb (moire silk pattern)
Brown Newfoundland seal	Seal (brown hair)
California mink	Ringtail cat
Cape seal	Rabbit (sheared and dyed)
Caracul }	Persian lamb (close curl)
Karakule }	
Caracool }	
Cat	Rabbit (sheared and dyed)
Civet cat	Small striped skunk; or hydrophobia skunk
Chinchilla	White rabbit (dyed)
Clipped seal	Rabbit (plucked and dyed)
Coney	Rabbit
Electric seal	Muskrat (plucked and dyed); coypu rat (plucked and dyed); rabbit (sheared and dyed)
Ermine (weasel)	White rabbit
Fitch	European polecat
Fox	Hare (dyed)
French sable	Rabbit (dyed)

Geller seal	Rabbit (plucked and dyed)
Genet	Cat
Hudson Bay seal	Muskrat (plucked and dyed)
Hudson seal	Muskrat (plucked and dyed); coypu rat (plucked and dyed); rabbit (sheared and dyed)
Isabella fox	Domestic dog (dyed and curled)
Japanese lynx	Black Manchurian dog
Karakule kids	Kid (dyed)
Koala	Wallaby (sheared and dyed)
Kolinsky	Red sable, or Siberian mink
Krimmer	Gray lamb skin resembling astrachan
LaMeuse seal	Rabbit (plucked and dyed)
Mink	Marmot (dyed)
Mole	Muskrat (sheared and dyed)
Monkey	Goat (dyed)
Muskrat	Rabbit (sheared and dyed)
New seal	Rabbit (plucked and dyed)
Northern seal	Rabbit (plucked and dyed)
Nutria	Coypu rat
Patagonian bison	China sheep (short haired)
Persian lamb	Domestic dog (dyed and curled); kid (dyed)
Persianer	Persian lamb (close curl)
Pointed Fox	Red fox dyed black, white badger hairs stuck in, and white tip sewed on tail
Polar seal	Rabbit (plucked and dyed)
Real Russian sable	American marten (sable); Hudson Bay marten (sable)
Real seal	Muskrat (plucked and dyed)
Red River seal	Muskrat (plucked and dyed); coypu rat (plucked and dyed); rabbit (sheared and dyed)
River mink	Muskrat (blended)
River sable	Muskrat (natural)
Russian otter	Muskrat (blended)
Semeuse seal	Rabbit (plucked and dyed)
Sable	Hare (dyed); marmot (dyed); mink (dyed); rabbit (dyed); Norwegian fitch (dyed)
Sable Fitch	Norwegian fitch (dyed)
Seal	Coypu rat (plucked and dyed); otter (plucked and dyed)
Seal Musquash	Rabbit (sheared and dyed)
Sidney raccoon	Wallaby (sheared and dyed)
Skunk	Marmot (dyed); wallaby (dyed); opossum (sheared and dyed); wallaby (sheared and dyed)
Two L seal	Rabbit (plucked and dyed)
White Fox	Northern hare
Wombat	Koala

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